10¢ A COPY

The OIL WEEKLY

Exclusively Devoted To The Production and Transportation of Oil and Gas

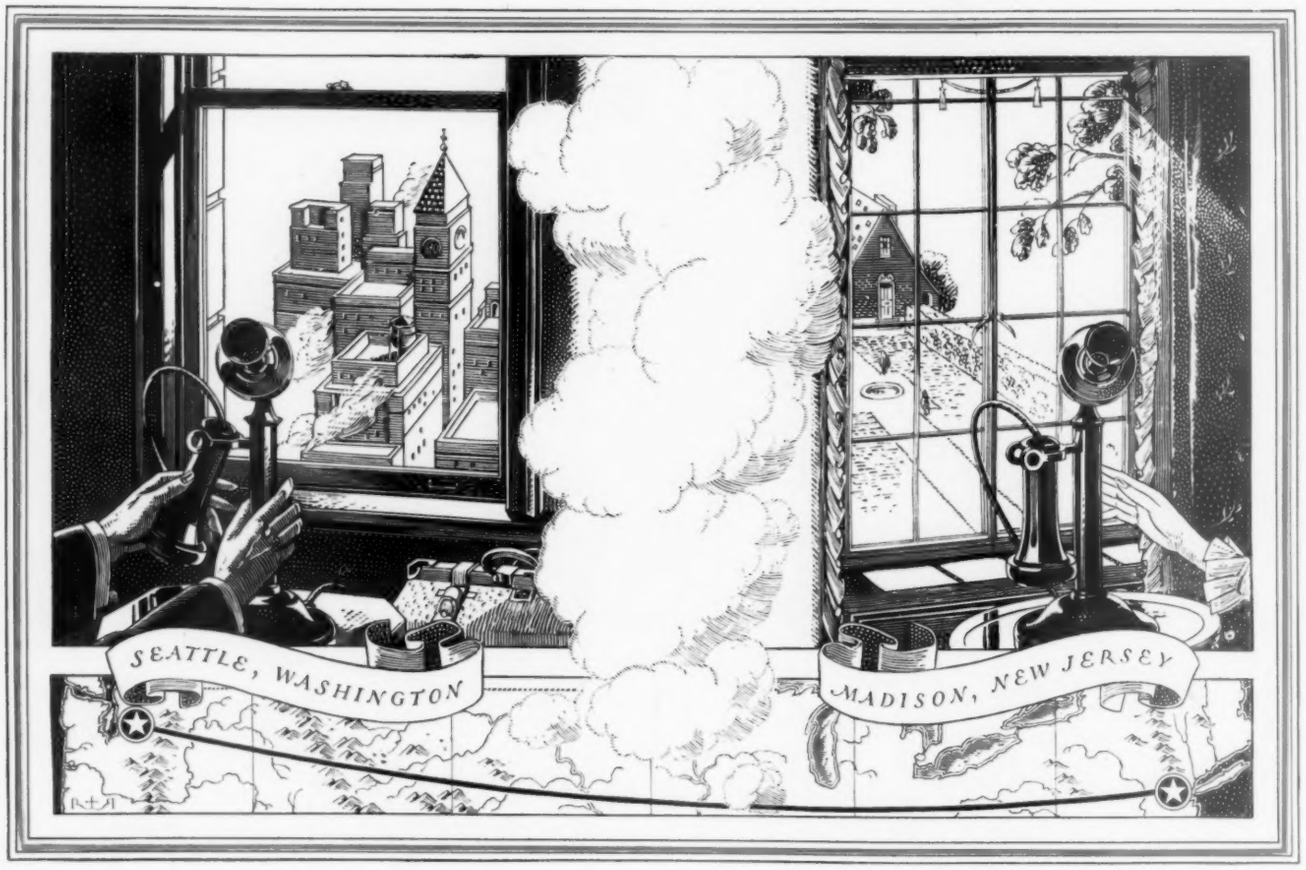
December 14, 1928 **Volume 51. No. 13**

The first Rotary Rock Bit to successfully penetrate hard formations was invented and marketed by the Hughes Tool Company

The HUGHES TOOL COMPANY

first in Service to the Petroleum Industry

"Setting Free the Mind as by a Miracle"



An Advertisement for Bell Long Distance Telephone Service

In Seattle, Washington, far from home. Homesick. Lingering doubts and apprehension about the welfare of his family in Madison, N. J., 3000 miles away.

He filed a telephone call, and a few minutes later the operator signaled.

A crisp, "Go ahead, please!" and then across the plains, mountains and valleys came to him the reassuring tones of a familiar voice.

"Setting free the human mind as by a miracle," is how this man describes long distance calls.

And business doubts are banished just as quickly. Whether in business or personal matters, telephone calls will quickly clear the worries off your desk and out of your mind. You will be surprised how little long distance calls cost.

Under the new station to station day rates, Los Angeles to Chicago is only $6.25. Denver to St. Louis, $3.50. Miami to Atlanta, $2.80. Dallas to New Orleans, $2.20. Pittsburgh to Cleveland, 80c. Atlantic City to New York, 70c. Baltimore to Philadelphia, 70c. What distant calls could you make to advantage, now?

The station to station day rate from the Statue of Liberty to the Golden Gate is only $9.00. . . . Calling by number takes less time. . . . . *Number, please?*

The OIL WEEKLY. Issued weekly by the Gulf Publishing Co., 3301 Buffalo Drive, Houston, Texas. Subscription price $1.00 per year; 10 cents per copy. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1897.

NEW!

A GASO PORTABLE DIESEL PUMPING UNIT

Small semi-permanent and permanent pipe line stations will find this new GASO unit ideal because of its combination of portability with efficiency and durability.

The pump is our GASO No. 710 Enclosed Type, Self-Lubricating Power Pump, for working pressures up to 1400 lbs., with interchangeable liner fluid end taking liners from 2½" to 7" diameter and giving capacities from 38 gallons per minute at 1400 pounds pressure up to 520 gallons at 300 pounds pressure.

Durability is secured in this pump by rugged construction and correct design. Every working part is protected from dust by the oil-tight case and runs in an oil bath.

Pinion shaft bearings are TIMKEN TAPERED ROLLER BEARINGS and main bearings are lined with genuine babbitt, both being easily adjustable to wear. Open hearth steel continuous tooth herringbone gears, center driven, running in oil, insure highest efficiency and quietness.

The power plant is a BUDA M. A. N. full Diesel 4-cylinder engine of 90 H.P. The unit is rigidly mounted on H-beam skids.

This unit is suitable for any oil field service requiring the above capacities and working pressures. Write, wire or phone for detailed information.

GASO PUMP & BURNER MFG. CO.
TULSA, OKLAHOMA

GASO PUMPS
for every oil industry need

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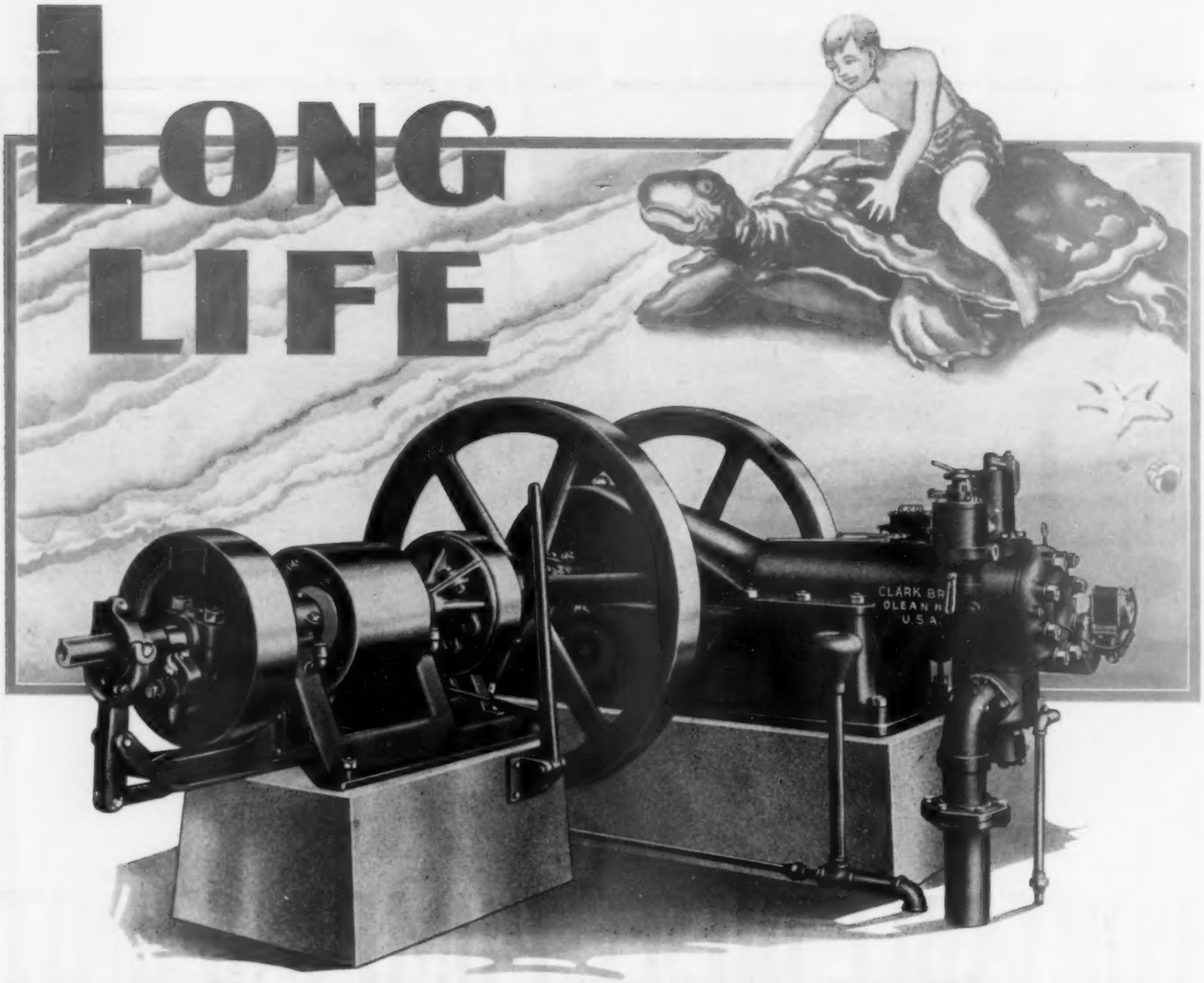
LONG LIFE



STUDY THE ENDURANCE OF THE CLARK PUMPING UNIT

Clark Bros. Co. OLEAN N.Y.

Since the life of an engine controls its replacement and maintenance economy, operators should be interested in the fact that the CLARK Pumping Unit is built to emulate the tortoise—which may have seen Columbus land in America, yet is still going strong.

Study the sturdy construction of the CLARK 40 H.P. Gas Engine and the CLARK Pumping Engine Clutch. Note the scientific design, enduring materials and automatic lubrication. You will readily understand how this unit must have exceptional endurance.

The CLARK "40" is a 4-cycle engine, efficient and easily operated. Ask our engineers for *proof* of its dependability and long-time economy.

CLARK BROS. COMPANY
Olean, N. Y.

Branches and Warehouses:

125 W. First St., Tulsa; McCamey and Sweetwater, Texas; and Artesia, N. M.

SMITH, BOOTH, USHER COMPANY

228 S. Central Ave., Los Angeles and 50 Fremont St., San Francisco

CLARK

Say you saw it in The OIL WEEKLY

If you have not yet investigated the

HALLIBURTON

SAND TESTER,

you are overlooking a new factor of *safety* and *economy* in rotary drilling. . . . . Just think–an accurate open-flow test that tells you *before you set casing* what the sand contains.

Full details gladly mailed on request.

ERLE P. HALLIBURTON CO.
Duncan, Okla.

ERLE P. HALLIBURTON CO., Duncan, Oklahoma
Without obligation, please send me full details of the Halliburton Sand Tester, together with prices.

Name.....
Street.....
City.....
State.....

EVAPORATION *robs you twice!*

1. It reduces the volume of oil in storage.

2. It lowers the gravity of the remaining portion.

THE volumetric loss of oil through evaporation—great as it is—is not as serious under many conditions as the "secondary" effect of lowering the gravity of the entire stock through the evaporation of the lightest fractions.

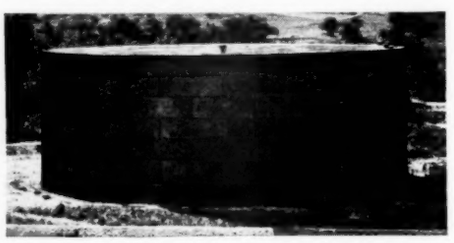
For example, assume a 55,000-bbl. tank full of 40 gravity oil. Assume that the construction of the tank and roof is good enough to keep evaporation down to 1% a year, a figure much better than the U. S. average. This would mean an annual volumetric loss of about 500 barrels which at $1.60 per barrel equals $800.

Now consider the loss in gravity. 1% volumetric loss equals 1/2.5 deg. A.P.I. drop in gravity or 0.4 deg. per year. Some tanks would be dropped into a lower grade and some would not. But figuring on the basis of this average, 0.4 x 5c equals 2c per barrel. Applied to the entire volume of oil remaining —49,500 bbls.—this would mean a loss of $990. The total annual loss in revenue on the assumed tank is therefore $1790.

Both of these losses can be stopped by the simple process of equipping the tank with a Wiggins Breather Roof. This flexing steel roof accommodates the daily variation in air vapor volume as the temperature rises and falls without discharging any vapor or breathing in any fresh air. Except for slight losses during emptying and filling and during extreme seasonal changes, this roof, therefore, eliminates volumetric loss from evaporation. It has demonstrated its ability to do this and to maintain the gravity without any loss for a full year. It therefore stops both forms of loss ordinarily experienced in standing storage as a result of evaporation.

A Wiggins Breather Roof can easily be applied to either new or old tanks. Ask our nearest office for estimating data.

STOP IT with a WIGGINS BREATHER ROOF



CHICAGO BRIDGE & IRON WORKS

Dallas	3338 Magnolia Bldg.	Detroit	1515 Lafayette Bldg.
Chicago	2142 Old Colony Bldg.	Philadelphia	1613 Jefferson Bldg.
New York	3144 Hudson Terminal Bldg.	San Francisco	1050 Rialto Bldg.
Cleveland	2241 Union Trust Bldg.	Havana, Cuba	Apartado 2507

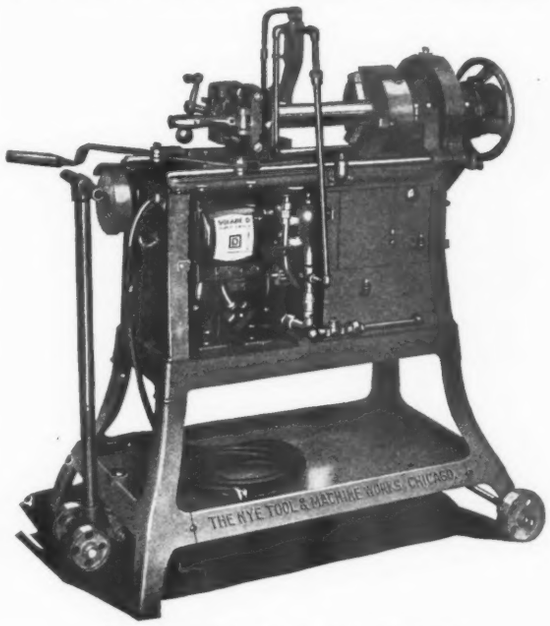
FLOATING *for working storage* **WIGGINS ROOFS** BREATHER *for standing storage*

OW 12-14-Gray

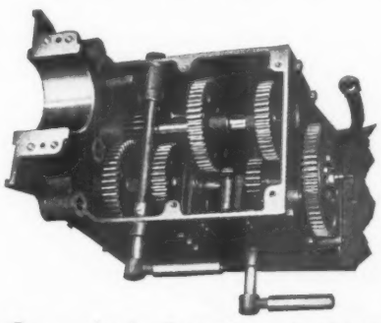
Say you saw it in The OIL WEEKLY

A Letter from Harry G. Nye

NYE POWER MACHINES
ALL GEAR DRIVEN—NO BELTS OR CHAINS



No. 100—capacity ¼ to 2 inches inclusive
No. 200—capacity ¼ to 2½ inches inclusive



Gear Case running in oil, assuring perfect lubrication.

QUICK OPENING DIE HEAD
Equipped With Trouble Proof Ring Type Dies
(No Chasers)

To the Oil Men of the U. S. A.

Fellow Citizens:

We have had so many eat-more-apple weeks and drink-more-raisin days in this country that I am thinking of starting something like that for the plumbers and steamfitters.

Apples are all right, and I like 'em, although I believe onions would keep the doctor away just as well, and farther. But when it comes to health, the plumber and steamfitter beats either one.

What happens when a man wants to take out life insurance? The doctors look at his underwear, peek down his epiglottis, and wrap a piece of old inner tube around his biceps and read his blood pressure.

What the doctors ought to do is to go to a man's house and look down his sink and test his water pressure. What they ought to do is to inspect his sewer system, not his nervous.

They ought to ask him about his bathing habits, if any. The man who is in his tub every Saturday night and in his pew every Sunday morning is a good risk in any man's company.

Instead of asking him "how's your heart?" they ought to ask him "how's your heating plant?" His furniture may be up to date, but how's his furnace? How's his circulation?—hot and cold water I mean.

An ounce of prevention is worth a pound of cure, and less expensive. What this country needs is birth control, of typhoid germs. A typhoid germ doesn't mind a doctor, but sure does hate to see a plumber come around.

There ought to be one day in the year when nobody was allowed to eat any apples, so the doctor could come around and diagnose the pipes, and write out a prescription for the plumber or steamfitter to fill.

He might even go so far as to insist that Nye Tools be used on the job, so as to be sure of a good one. They work so much better that it would be better for everybody. (And easier and faster).

An apple a day is all right, but a plumber once in awhile is better yet.

Sincerely,

HARRY G. NYE.

Otherwise known as

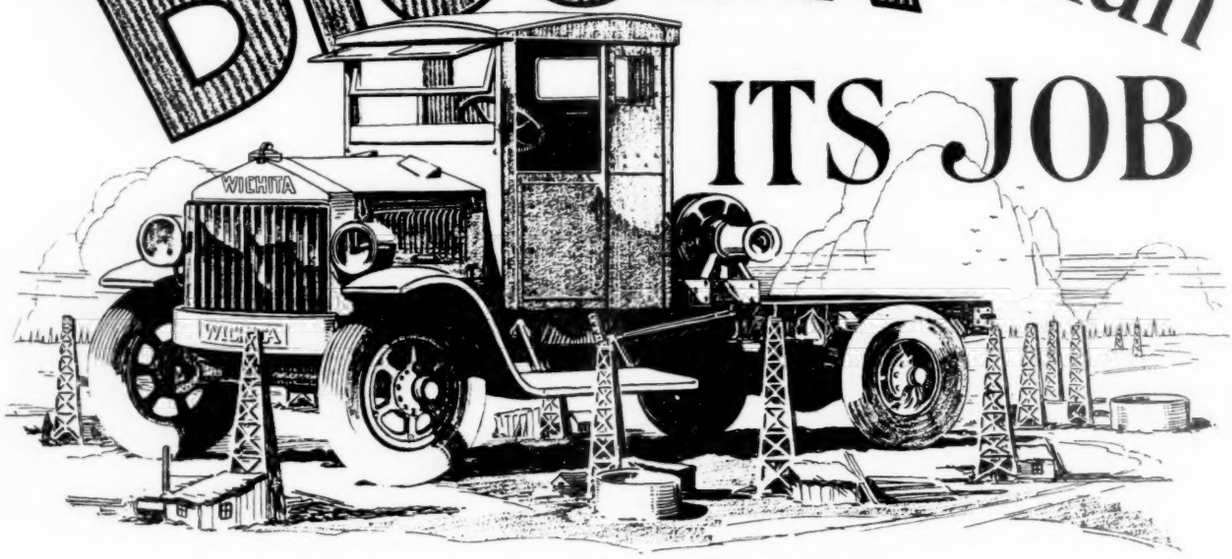
Universal Shaft operating stocks up to 12 inches

Manufactured by

THE NYE TOOL & MACHINE WORKS

4120-4130 FULLERTON AVENUE,
CHICAGO, ILL.

BIGGER than ITS JOB



The WICHITA "Oil Field Special"

Built in the oil field country to do the work of the oil fields. Unit by unit, it is designed expressly for unfailing service under any condition.

OIL FIELD transportation is a big job that demands the best in truck construction. The Wichita "Oil Field Special" is designed to be bigger than the job. Built at the Wichita Factory by engineers who have specialized for 18 years in the manufacture of better trucks, the Wichita is a "hog for punishment" that has been an important factor in the development and operation of every important Southwestern oil field.

[Send today for illustrated catalogue. Actual photographs reveal the *unit by unit* construction of this special truck. See for yourself the features that make this truck bigger than its job.]

The Wichita Falls Motor Company

J. A. KEMP, *President* Wichita Falls, Texas

Thousands of . . .
"BLACK BEAUTY" POLES
Carried In Stock Ready-To-Ship

WHEN unexpected poles losses or other emergencies occur, and you need poles quickly—remember that the Producers of "Black Beauty" Poles keep on the dry sand-filled plant storage yards at Orange, Texas, thousands of select creosoted Southern Yellow Pine Poles—in many lengths and sizes, ready to load for immediate shipment, and to be immediately installed when they arrive at destination.

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Orange, Texas, U. S. A.
Sales Representatives:
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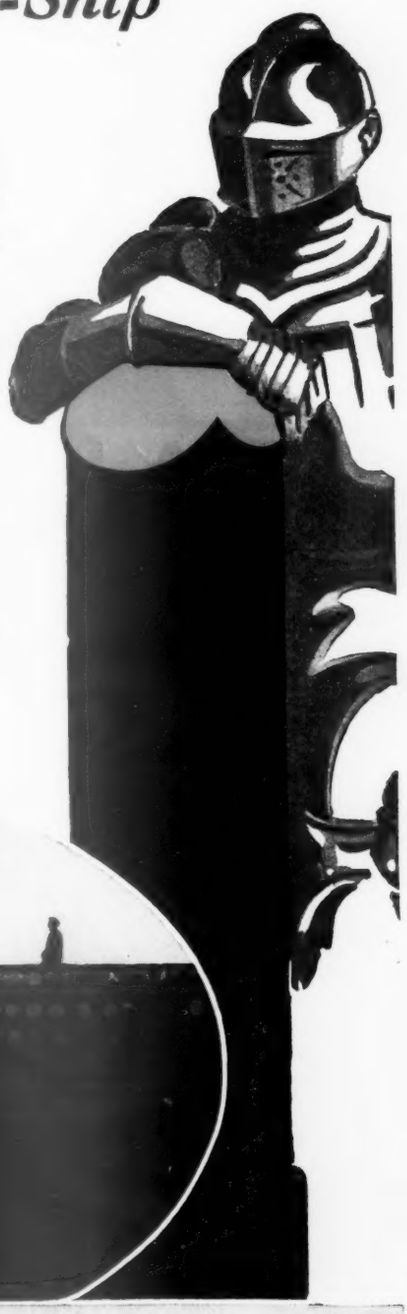
W. W. Wilkinson, 1213 Insurance Ex. Bldg.
HOUSTON, TEXAS
W. L. Wood, 1203 Esperson Bldg.
TULSA, OKLA.
Electric Appliance Co., 213 E. Archer St.
KANSAS CITY, MO.
American Electric Co., Inc., 622 Wyandotte St.
COLUMBUS, OHIO
J. H. Beaty, 243 N. High St.



Know them by their Red Tops.

OFFSETTING THE BACKLASH ON SPUDDER WORK

J. L. Miller of Miller & Hyther, Albany, Texas

New improvements in the design of the Climax Spudder Engine, as shown at the Exposition, include a larger clutch and output shaft. This construction provides even greater reserve strength in the power take-off. This spudder engine can give you the kind of reliable, ever-ready service that reduces the gamble in drilling—the kind of service that is often the difference between finishing and losing a hole. In addition, this Climax Spudder Engine is light and easy to transport from one location to another. And it uses either natural gas or gasoline. You cannot afford to overlook these advantages. Ask for details.

This is S. C. Hyther (left), driller and C. Overton Toolie

CLIMAX ENGINEERING COMPANY
75 West 18th Avenue :: Clinton, Iowa

CLIMAX Trade Mark Reg. U. S. Pat. Off.

This shows how Miller & Hyther had their Climax Spudder Engine hooked up at Albany, Texas

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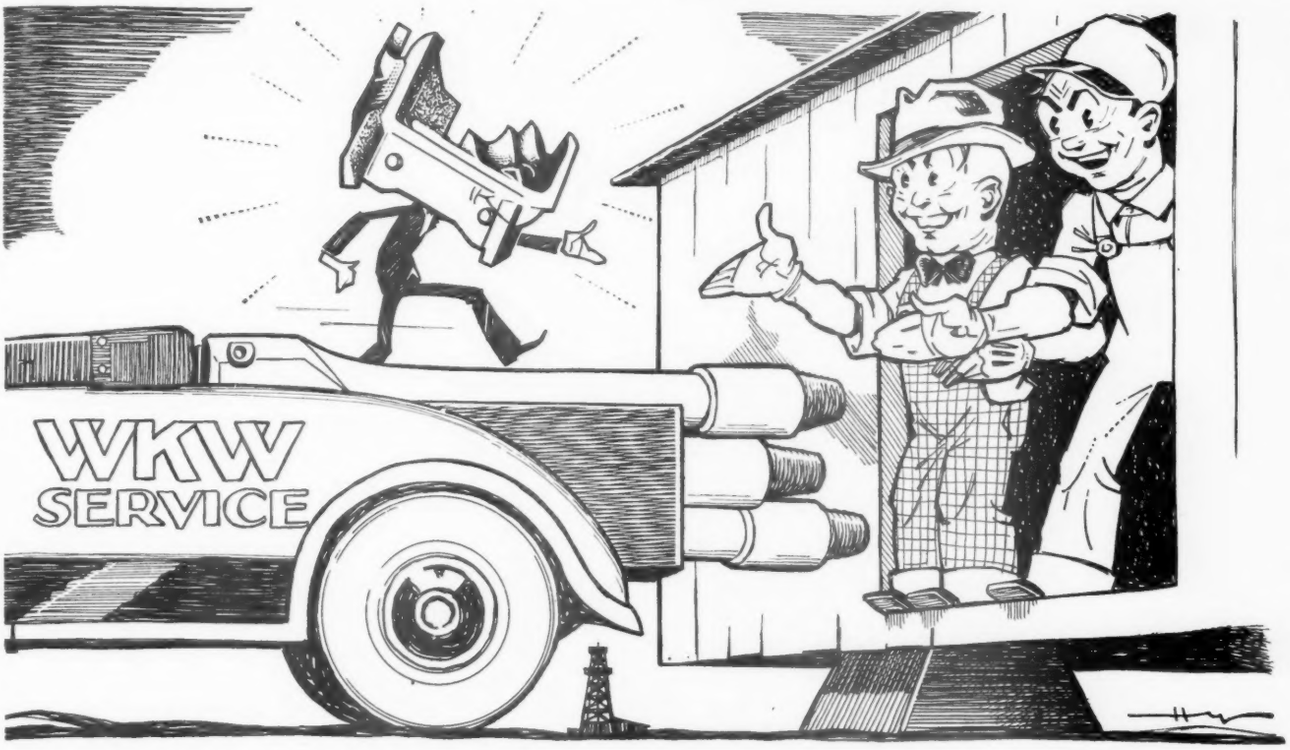
THE NATIONAL SUPPLY COMPANIES

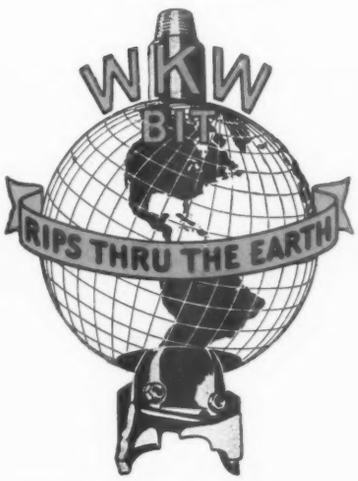
Say you saw it in The OIL WEEKLY



W-K-W Drilling Bit—

makes friends with your Crew

It stays *down* on the job and digs *more* full-size hole thru hard or soft formation.



The Bit that offers:

1. More hole per bit.
2. Increased cutting surface.
3. Faster drilling.
4. Straighter hole.
5. Less strain on drill pipe.
6. Fewer twist-offs.
7. Less vibration.
8. Less cost per foot of hole drilled.
9. Less under-reaming.

—and

saves "wear and tear" on the crew and on the complete drilling outfit.

Patents Pending

Wieman-Kammerer-Wright Co., Inc.

HOLLYDALE *(Los Angeles County)* CALIFORNIA

Mid-Continent Distributors:
Emsco Derrick & Equipment Company, Plants, Stores and Warehouses.

Foreign Distributors:
Emsco Derrick & Equipment Company, 150 Broadway, New York City

The Special Master Appointed By the District Court of the United States Finds the FLUID PACKED PUMP PATENTS INFRINGED

Here's a finding of great importance

Look For This Tradename On Every Pump

FLUID PACKED PUMP

Manufactured by Fluid Packed Pump Co. — FPP — Post Office Box 64 Los Nietos, Calif. U. S. A.

It Is Your Assurance of PROTECTION

Insist On The FluidPackedPump

On November 17, 1928, the Special Master handed down a draft report finding that the Winsor patent 1,621,046 held by the Fluid Packed Pump Company and Joseph G. Richardson has been infringed by the Ford Specialty Company. The Master recommended that the Ford Specialty Company be perpetually enjoined from further infringement and be forced to account for all profits and damages. This case was tried before the District Court of the United States for the Southern District of California, Southern Division, by the Special Master David B. Head.

The
FLUID *Packed* PUMP
PATENTED
1483369 Dated Feb. 12, 1924
1483370 Dated Feb. 12, 1924
1545474 Dated July 14, 1925.
1545475 Dated July 14, 1925.
1549175 Dated Aug. 11, 1925.
1621046 Dated March 15, 1927
Other Patents Pending
F P P

FLUID PACKED PUMP CO.

P. O. BOX 64, LOS NIETOS, CALIFORNIA

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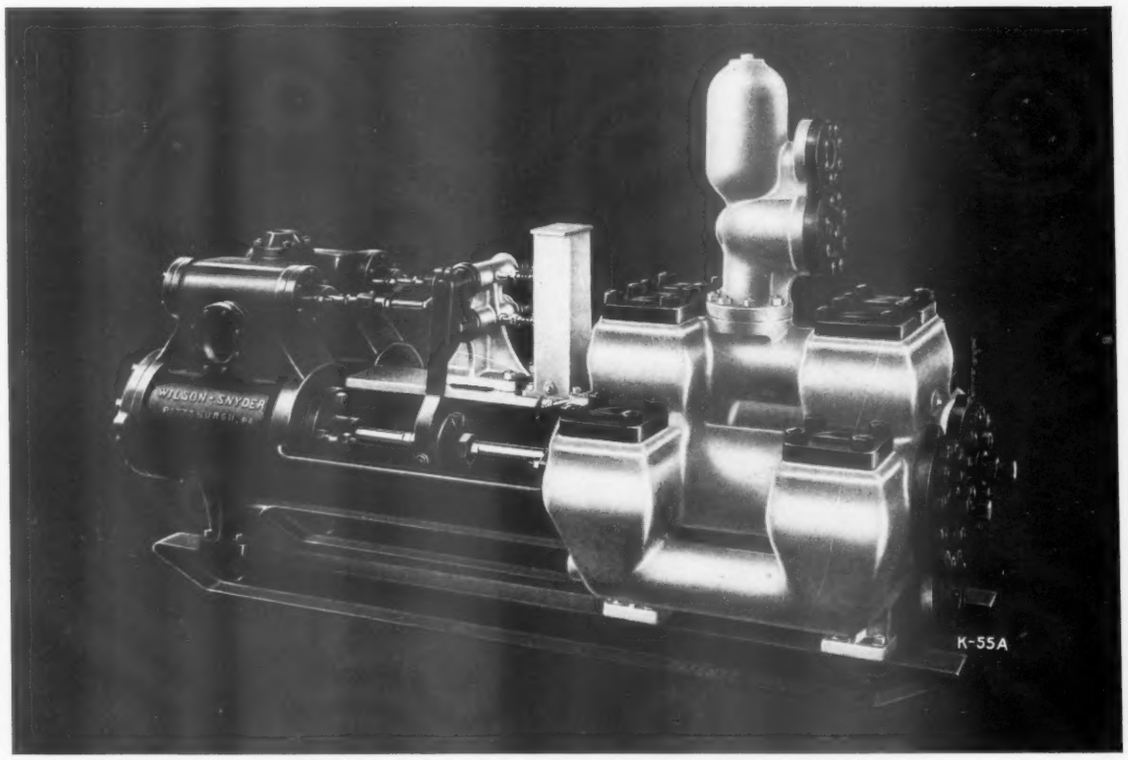
South American Representative
TONY STATTS, MARACAIBO, VENEZUELA, C/O AMERICAN CONSUL

28 WILSON-SNYDER SLUSH PUMPS

Are Now Successfully Drilling Wells for One Large Texas Company



A Tribute befitting the Worthiness of the NEW No. 18 SLUSH PUMP

WILSON SUPPLY COMPANY

1412 Maury St.
Houston Texas

OIL AND GAS WELL SUPPLIES

BRANCHES
Beaumont, Luling, Texas

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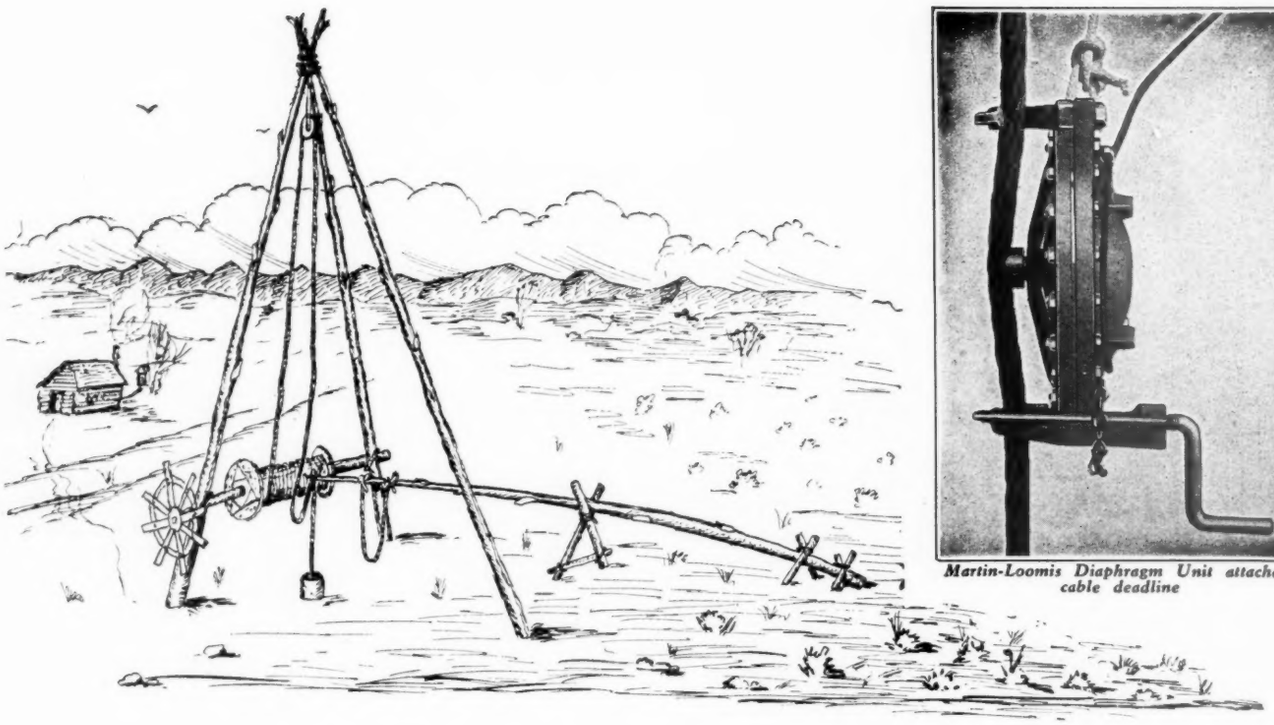
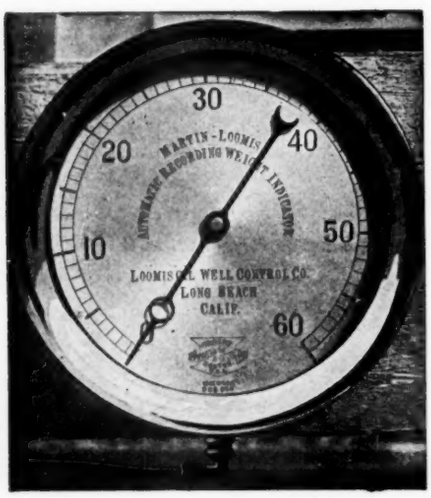


Martin-Loomis Diaphragm Unit attached to cable deadline

The Old *Hemlock* Engine

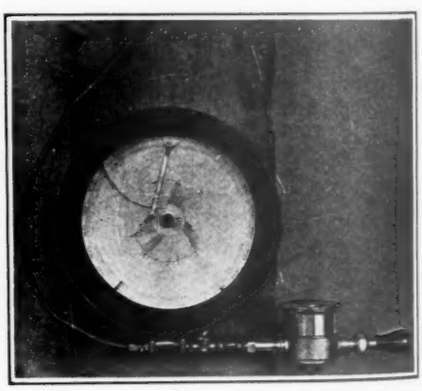
BACK in the days of '62, when drilling wells was not a complex proposition, all that a man needed to put down a "bore" was a lithe hemlock sapling and a strong right leg. And that's when Jim Martin, father of the inventor of the Martin-Loomis Weight Indicator, started drilling wells in Oil Creek, Pa. at the handsome salary of $1.25 per ten hour day.



Weight Indicating Gauge mounted on derrick girt constantly in view of driller

A lot of water has flowed under the bridge since Jim Martin's time but the rich experience of that hardy pioneer of the oil business has been handed down through two generations that have maintained a lifelong contact with the petroleum industry. This, then is the lineage of the most important development in oil field practice since the introduction of the rotary—namely the Martin-Loomis Automatic Recording Weight Indicator.

This hookup, the pioneer in the fields, eliminates the uncertainty of drilling by the "feel of the brake." It gives the driller an accurate indication at all times of the weight on the bottom or the weight on the hook. During the work of coring, fishing, or making hole, the Martin-Loomis Weight Indicator is always on the job guiding the driller and increasing the efficiency of all operations. Martin - Loomis equipment is now in use in oil fields all over the world. Its installation is the logical step of every practical progressive operator — one step farther away from the old hemlock engine days.



Recording Unit in belt house compiling a 24-hour graphic record of all drilling operations

Literature and complete information gladly sent upon request

MARTIN-LOOMIS CORPORATION

2827 Cherry Avenue, Long Beach, California, U. S. A.

Foreign Distributors
OIL WELL SUPPLY COMPANY
PITTSBURGH, PA.

AND THROUGH ALL SUPPLY STORES

Mid-Continent Distributors
REED ROLLER BIT COMPANY
HOUSTON, TEXAS

for corkscrew wells

—the more crooked the well the more it needs Bettis Protectors

79,968 Bettis Protectors now used by 90 Companies

Ask for Catalog

Patterson-Ballagh Corp.

Manufacturers of Bettis Protectors

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Texas and Louisiana Distributors:

Bettis Sales Co., 617 Public National Bank Bldg., Houston, Texas

New York Office: 39 Cortlandt St.

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Say you saw it in The OIL WEEKLY

"If It's An ALCO Tool It's Modern"

Hard Formation Bit

ALCO

Rotary Core Drill

We

Announce

The Appointment

of

J. C. Hillman

of

Houston, Texas

As Our

Mid-Continent

Sales Manager

Alco Oil Tool Co.

Box A

Compton, California

U. S. Patent Numbers
1430072 1577875

The Newest
And Best
Try Our Service.

ALCO BITS
DRILLING & CORING

"If It's An ALCO Tool It's Modern"

FOR SUCCESSFUL PERFORMANCE · A.G.C. OF A. ·

– A Noteworthy Engineering Tribute

The Seal of Successful Performance awarded Heavy Duty Red Seal Continental engines is a tribute to their enduring economy and dependability through years of use.

Many of the country's outstanding construction firms offer conclusive evidence of the continuous service Continental Motors are rendering in this field—proof positive of their reliability in meeting varied conditions and demands. Wherever gasoline power is used in industry there you will find Heavy Duty Red Seal Continental engines speeding production and cutting operating costs.

CONTINENTAL MOTORS CORPORATION
INDUSTRIAL EQUIPMENT DIVISION
Office and Factory: Muskegon, Michigan
The Largest Exclusive Motor Manufacturer in the World

Continental Motors

Say you saw it in The OIL WEEKLY

MECHANICAL RUBBER COMPANY

Rough Rider Belting

ROUGH RIDER Rubber Belting is built to withstand the most severe usage encountered in oil field service. The cover of highest grade stock offers maximum resistance to abrasion. The duck used in this belting is made to the definite specifications of the manufacturer, who has given special attention to its construction. Friction between plies is an extremely tough compound with exceptional adhesive qualities. Inner plies are lockstitched together with strong twine in a manner to prevent bootlegging. ROUGH RIDER materials and construction reduce stretching to a minimum.

A trial of ROUGH RIDERS will give you a new conception of belt satisfaction and stamina.

"I CONTINENTAL Sells It, There Is No Better"

THE CONTINENTAL SUPPLY COMPANY
General Offices: St. Louis
Export Office: 74 Trinity Court, New York
London Office: 316-317 Dashwood House, Old Broad St., E. C. 2
THE CONTINENTAL SUPPLY COMPANY, Ltd.,
411 Lancaster Bldg., Calgary, Alberta, Canada

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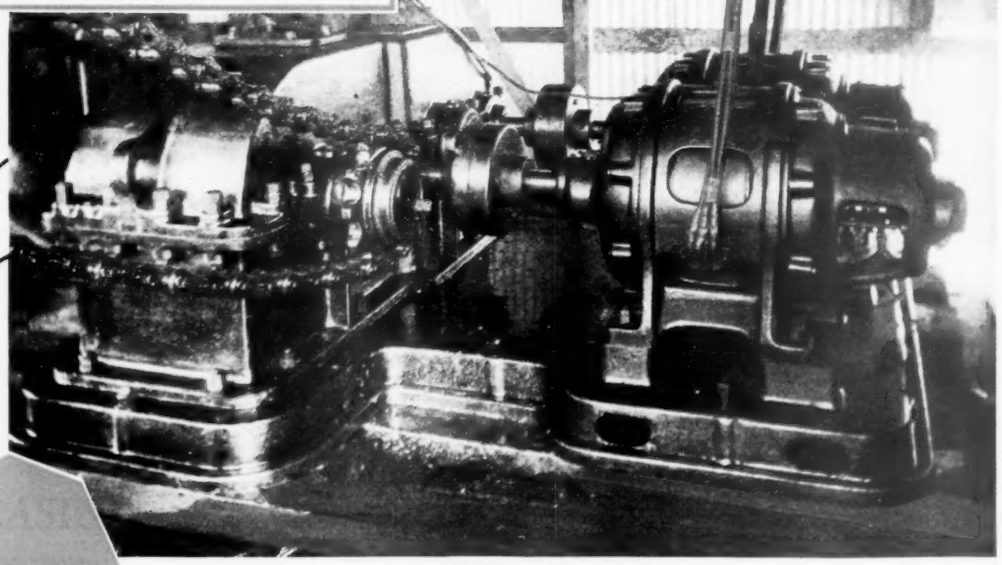
Stop worrying about water



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WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

Say you saw it in The OIL WEEKLY

Practically All Major Fields Show Increased Production

Texas contributes gain of 15,550 barrels daily, while California output rises another 2,800 barrels; further improvement in Oklahoma

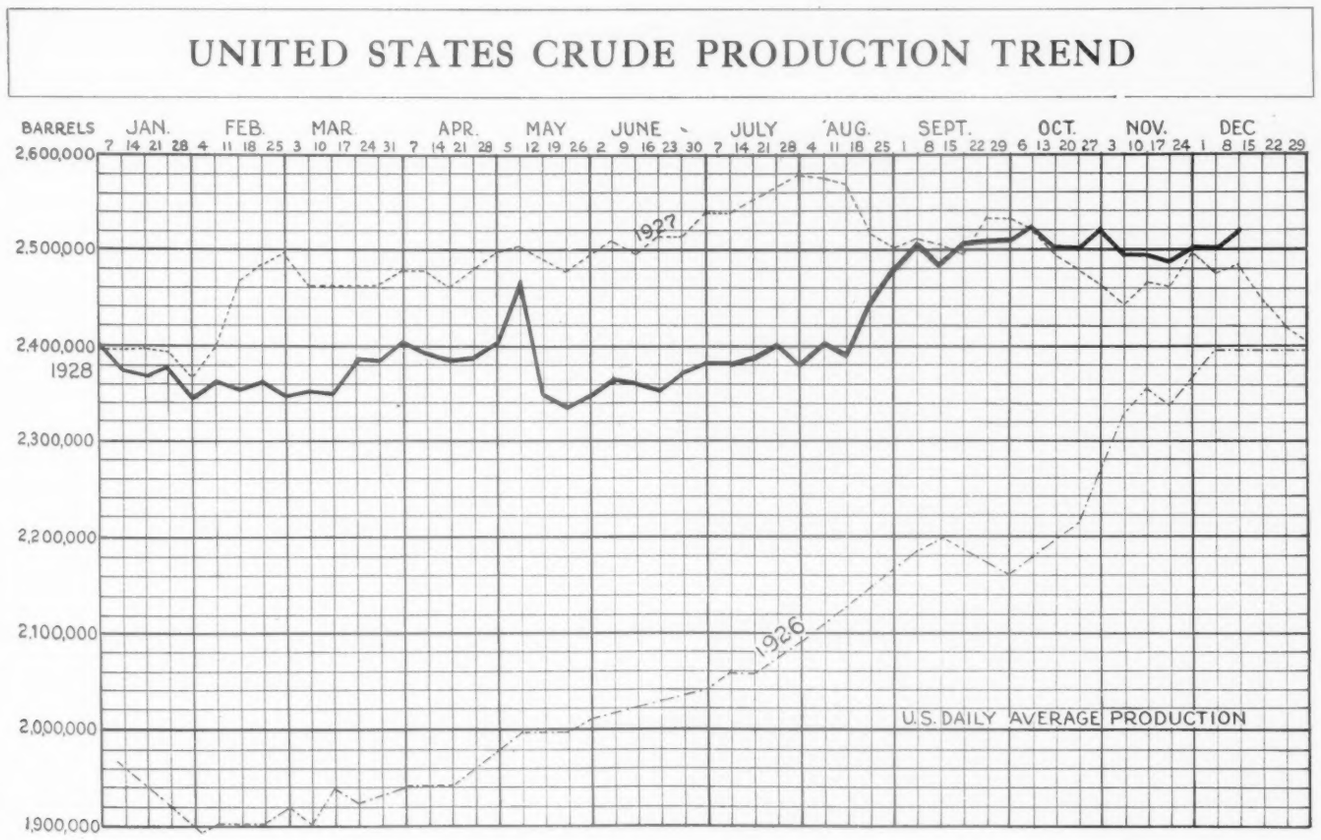
By H. J. STRUTH
Petroleum Economist

WHATEVER encouragement has been held over the immediate trend of the crude market seems to be fading out as the tide of crude production continues to mount. Last week, practically all major fields registered an increase in daily average production. Texas was conspicuous with a disturbing rise of 15,550 barrels daily for the combined fields of that state. Coastal Texas, Southwest Texas, East Central and Panhandle Texas, led all other fields with respective gains of 10,450 barrels, 2700 barrels, 1000 barrels, and 1000 barrels in their daily average output. California's production continues to rise, showing a gain for last week of 2800 barrels. Both Kansas and Oklahoma are giving evidence to the effect that wildcatting is resulting in great success. The only major fields that showed a decline in production during the past week were Oklahoma, Rocky Mountain States and North Louisiana. Further declines in output in the St. Louis and Seminole pools furnished the only bright spot in the entire situation during the past week, although, in Louisiana, a premium of 10 cents a barrel was announced on December 11, by the Crystal Oil Refining Company, on all Caddo and Pine Island crude of 32 gravity and above. On the whole, the crude situation has show no improvement; in fact, there is less room for optimism now than there was up to a few weeks ago.

Regardless of what may be said concerning the growing demand for light oil, it must be conceded that actual and potential supplies of crude, both light and heavy, are still far in excess of what could reasonably be termed normal. The ease with which new producing areas are being discovered in many sections of the country, clearly indicates that this is no time to "tear off the lid" and hike the crude market. It is noted, however, that there is less speculation now over the possibility of marking up crude prices, as conditions continue to accentuate the inadvisability of such action. It was indeed gratifying to absorb the sane remarks of some of the leaders of the petroleum industry, at the recent A. P. I. meeting. If all of their constructive comments were welded into one sentence it would read, "There is still much to be done in a cooperative way before our industry will definitely pass the crisis of its present illness."

Need for Curtailment

Why should we try to "kid" ourselves into believing that the petroleum industry is on the eve of a period of prosperity, when there is danger of being engulfed in oil? Even if the facts at hand do not represent 100 per cent. accuracy, they show, nevertheless, the direction in which we are going—and there is no denying the fact that the going is decidedly rough. Unless crude production is held in check so that the continually growing demand will at least show some signs of converging with it, there will be little justification for a better crude market. Eventually, demand will make it difficult for the industry to maintain an adequate supply of crude—but we are still a long ways from that era. Our reckoning is with the immediate future—next spring—and it will take some mighty hard work to figure out the problem of absorbing



a boost in the crude market at that time, judging from the present situation

The optimistic crude oil market outlook for the year 1929 held by Oklahoma and Kansas oil operators took an uncertain feeling during the past week as the result of several important wildcat strikes. There apparently is plenty of oil production in sight for 1929.

Kansas came into the limelight the past week with a 5000 to 7500 barrel wildcat well north of Wichita in Sedgwick County. This area is well under control with Marland Production Companw owning all of the immediate acreage, but like the Oklahoma City well it will result in a big wildcat play, which may develop additional fields.

The one bright spot in the Oklahoma situation is the decline in Greater Seminole production and little possibility of the St. Louis pool showing a material increase. This cannot last for long, however, as Mission and Maud districts will throw their recovery on the market shortly after the first of February. Thus far Seminole and St. Louis production has failed to decline sufficiently to make room for the anticipated recovery of these two areas.

Prairie Pipe Line Company crude oil shipments for November was 5,461,566.51 barrels, a decline of 758,813.72 barrels from the previous month. The decline is partly due to the floods during the month which caused several of the company's pumping stations to be shut down.

Refined Market Slow

Group 3 refined market remained practically stationary during the week. Large crude oil runs to still continued and show little signs of letting up, with the result that the general expectancy is that the situation may be effected before the winter has passed. 50-60, 437 end point, gasoline (New Navy) had an average price of 9 cents per gallon. Some underselling continues. 60-62, 437 gasoline, had an average quoted price of 9½ cents which is the same as the previous week. Other refined products were priced the same as last week.

An inquiry for a large volume of high test gasoline for export delivery was made during the past week in Mid-Continent refining circles and little effort will be required to cover on the order, since trading has been greatly restricted by domestic jobbers lately, resulting in a shakedown of prices. Lower quotations posted by the plant owners have failed to arouse domestic jobbers and the piling up of stocks of the lower gravities opens the way for further price concessions.

Increased use of gas oil for home burners is reflected in the demand now existing for this product which is one of the most active from a standpoint of trading an refiners are running behind on their shipments, at prices ranging from 2¼ to 2⅝ cents per gallon.

The decline of current quotations on U. S. motor gasoline and a corresponding cut in other motor fuels, has placed the North Texas plant owners on a narrow margin of profit, thus causing a few that are equipped with cracking units to curtail their crude runs and buy distillates and fuel oil for cracking.

The fuel oil market has been slow in North Texas this winter and prices remain at 52½ to 55 cents per barrel.

No Hitch in California

Increased production in California is being handle without a hitch and is expected to be handled the same way in the future if Mid-Continent and foreign fields do not start cutting in heavily on the state's principal outside markets. California was once almost an independent domain in the oil industry, but during the past six years there has been a gradual overlapping of competition in many markets. California, the Gulf Coast and South America have been seeking the same outlets in disposing of surplus products and all have been thrown directly in competition by a large expansive program. California has been disposing of a good part of her crude in altogether new markets during recent years. Likewise, other districts, both foreign and domestic are seeking the same outlets.

Daily production already has reached a high figure, due to the rise in the Santa Fe Springs field and the stubborn resistance to a further decline offered by the Long Beach field, and an additional 200,000 barrels is expected soon after the first of the year, unless conservation becomes more of a reality. Storage is ready to receive a greater part of the increased production. Santa Fe Springs crude is very light, as California grading goes, and the situation seems well in hand. A larger production than expected or a more prolonged maximum production than anticipated would break the market, just as it has been broken before, however.

The disappointment caused by the lack of uniformity in the Buckbee zone in the Santa Fe Springs field has been offset by the remarkable showing of the intermediate zone above, and there is a possibility that the field will not decline as fast as anticipated. Another month will be required to show the probable maximum production.

Curtailment seems the most logical way to handle the situation and every effort is being made to force the issue. If the gas wastage reaches a high figure, there is every reason to believe that the wells will be pinched in.

Both gasoline and fuel oil remains unchanged, with the latter moving slowly. Increased prouction of crude and greater refinery runs is expected to have a slightly depressing effect on both of these commodities.

Details on Critical Fields

Pool—	Oil Wells Completed	Total Initial Production	Initial Per Well	Number Producing Wells	Daily Production Barrels	Daily Prod. Per Well	Rigs Up	Wells Drilling
WEST TEXAS—								
Hendrick	437	2,452,900	5,613	449	141,820	*316	12	95
Church-Fields	188	203,245	1,081	186	29,340	158	..	1
Gulf-McElroy	67	55,580	830	67	13,165	196	2	2
Yates	280	1,812,545	6,473	280	70,185	*251	8	9
Total	972	4,524,270	4,655	982	254,510	259	22	107
TEXAS PANHANDLE—								
Hutchinson County	1,130	548,630	485	1,004	28,055	28	3	23
Gray County	296	125,765	425	286	24,335	85	7	57
Carson County	181	59,370	328	158	5,835	37	2	11
Wheeler County	44	14,645	333	35	775	22	7	11
Moore County	5	3,650	730	3	3,445	1,148	2	9
Total	1,656	752,060	454	1,486	62,445	42	21	111
OKLAHOMA—								
Seminole	1,582	2,079,371	1,314	1,279	**279,350	218	59	191
St. Louis	281	315,155	1,125	263	129,999	494	12	81

*Production partially Pinched. **Mission and Maud districts partially pinched.

Oklahoma City Wildcat Production Source Uncertain

Restricted development provided by agreements between land owners and drilling companies who control large tract surrounding the well

By WARREN BAKER
Staff Representative

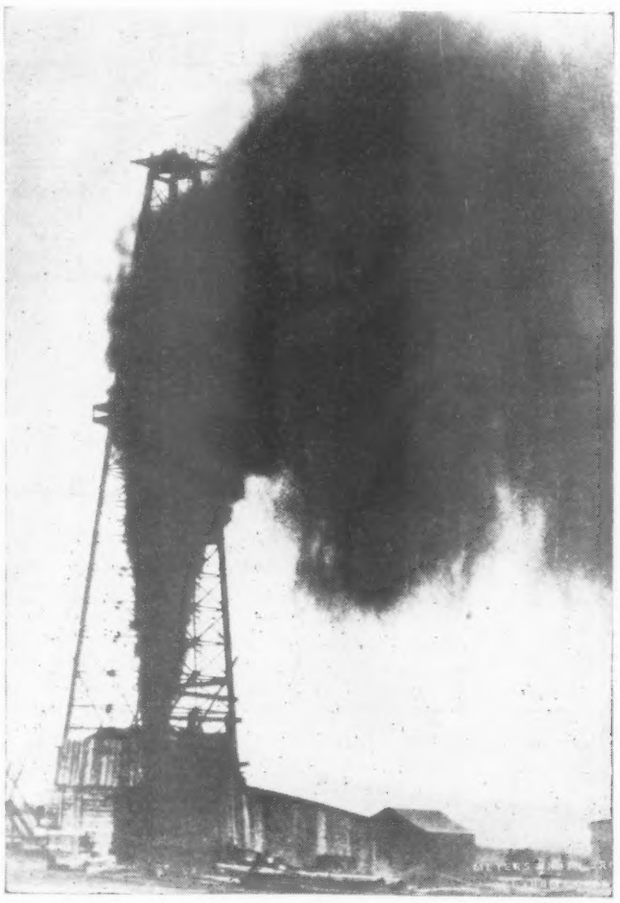
TULSA.—Indian Territory Illuminating Oil Company and Foster Petroleum Company's discovery six miles south of Oklahoma City represents the most important wildcat strike in Oklahoma since the finding of production at Seminole City July 16, 1926. It ranks among the outstanding discoveries in Oklahoma's oil history.

Further knowledge of the pay source will serve to more definitely determine the value of the discovery well, Oklahoma City 1, C SE SE Section 24-11-3w, which, as reported in these columns last week, blew in December 4 with an initial flow of 4909 barrels of 39.9 gravity crude from sand at 6357-6402 feet, the upper Mid-Continent's deepest commercial producer.

The producing formation is generally considered Simpson sand, but the absence of Sylvan shale in the well log throws some doubt on the exact source of the oil. The owners will shortly begin deepening the hole with Wilcox sand as the goal. Other locations in the immediate vicinity to be drilled soon, two of which are now preparing to start, will also aid in clearing up differences of opinion as to the pay horizon. This work, with the deepening of the discovery well, will command a wide interest since the newly opened area offers a prominent place in Oklahoma's future crude reserve, and opens the way for intensive development in portions of Central-Western Oklahoma which heretofore have been considered of little importance. The strike paves the way for concentrated drilling on acreage which has been blocked up the Canadian River into Western Oklahoma for the past two years.

Of great significance in this discovery is its relatively close location to Greater Seminole production, which is only 40 miles east and slightly south, and to the state's former deepest production in Logan County, little more than 40 miles north. Indian Territory Illuminating Oil Company and Foster Petroleum Company's strike is due to result in much wildcatting between Oklahoma City and the Seminole fields. Evidence of the faith in this stretch of country is seen in the fact that approximately 50 wildcat rigs are now running between the two points without the incentive offered by the new well. Proof of the strength of the newly opened field serves to offset any doubt of pay growing out of the dipping of formations more than 2200 feet at the point of the discovery from the horizon of big production in Greater Seminole fields.

To R. J. Riggs, chief geologist, Indian Territory Illuminating Oil Company, goes much credit for the discovery. He worked out the structure and urged the purchase of the acreage of the two companies amounting to roundly 9000 acres and the purchase of approximately 1000 acres of royalty under these leases. A. V. Hoenig, vice president in charge of production, Indian Territory Illuminating Oil Company, directed the drilling of the discovery well, and deserves credit for one of the most perfect deep holes drilled in the Mid-Continent. One interesting feature of this outstanding well is the economical drilling which, as reported, cost less than $100,000 to complete. This cost on a 6400-foot well compares with an average of $74,300 on Seminole wells, which averaged slightly more than 4200 feet. Another feat accomplished in the Oklohoma City wildcat discovery is the deflection of only 10 degrees from vertical, and another is the drilling to 6402 feet with rotary tools. It is the deepest producer in the Mid-Continent drilled to bottom with rotary.



Oklahoma City 1.

Well Log

Following are excerpts of the well log, which include the highlights of the well:

Location made May 26, 1928, and spudded June 12.

Set 125 feet 15-inch surface pipe June 13.

Base of red beds 1360 feet.

Showing of gas 2268 feet June 21.

Oil and gas show 2604-35 feet June 25.

Oil show 3540-41 feet July 8.

Oil sand 3996-4012 feet (Tonkawa series) July 20.

Gas flow estimated 25,000,000 cubic feet July 21.

Oil and gas show 4017-19 feet July 23.

Oil and gas in sandy shale 4106-23 feet July 25.

Oil sand 4148 feet July 26.

Oil and gas sand 4214-31 feet July 30.

Set and cemented nine-inch casing 4790 feet August 20.

Resumed drilling September 2. Gas broke in while preparing to core at 4816 feet September 6 and gauged 47,721,000 cubic feet. (Layton series.)

Pumped water and rotary mud in to kill gas and resumed drilling September 18.

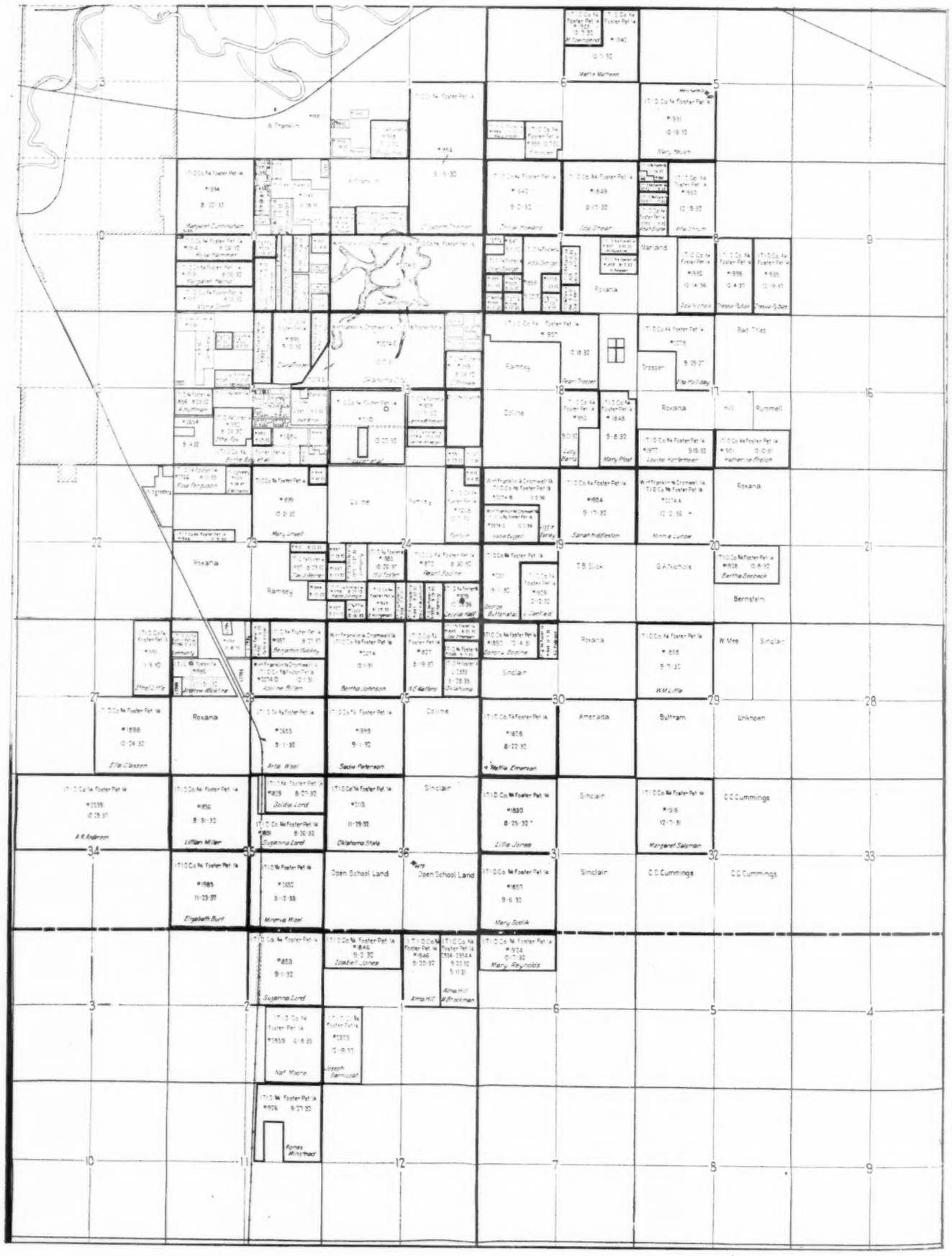
Approximately 800 feet of blue shale with thin breaks showing gas from 5250-6250 feet.

Set and cemented seven-inch A. P. I. standard casing 6355 feet on top of highly saturated oil sand drilled to 6402 feet November 12.

Unit Operation

A program of conservative

OWNERSHIP MAP OF NEW OKLAHOMA CITY AREA


Roxana
Ramsey
Colline
Sinclair
Amerada
Bultram
Unknown
Open School Land
Open School Land
Oklahoma State
Mary Reynolds
Isabell Jones
Alma Hill
Lillie Jones
Margaret Saltman
Bernstein
Mary Scelik
Minerva Wisel
Susanna Lord
Nat Moore
Agnes Wingfield
Elizabeth Burt
Lillian Miller
Ella Classen
Arta Wisel
Sadie Peterson
Martha Johnson
Benjamin Mackey
Goldie Lord
Andrew Wiseline
Mary Insell
Rose Ferguson
Mary Most
Sarah Middleton
Minnie Lunow
Bertha Stechack
T.B. Slick
G.A. Nichols
W.M. Little
Mary Knight
Mary Reynolds
Trosper
Hill
Rummell
Black Tikes
Mainland
Roxana
Ramsey
Colline
Roxana
Roxana
Roxana
Sinclair
Sinclair
Sinclair
Amerada
Bultram
Unknown
Open School Land
Open School Land
Oklahoma State

development destined to mean much to the industry in this particular field as well as being proven practical for other major fields grew out of the discovery before the well was completed. It follows the trend of unit operation, plans which have previously worked out in several other sections, but which is something of a new departure in conservation in this territory.

This plan, agreed upon by practically every acreage holder around the wildcat a month before completion, calls for the drilling of one well in the center of each forty as the first crop of wells to develop the field. It not only includes lease owners, but royalty owners as well, the latter having agreed in practically every case to participate in the single center well at first according to the fraction of an interest held in the fraction of the entire forty. An identical plan was worked out and adopted for development of gas, in the event the test resulted in a gas field, except that only a single gas well was to have been drilled to the forty. As in the case of oil, probably the only plan to be considered since the oil strike, the additional locations are to be drilled ultimately. The plan then, would result in some cases in the drilling of five wells to the forty, provided the lease holder desired to drill every location where a competitive acreage joined.

The first well drilled on each forty would serve to prove or condemn that particular acreage and would cut the drilling campaign to one-fourth that of common boom proportions. As explained by Burdette Blue, executive vice president, Indian Territory Illuminating Oil Company, in a recent interview, the proposed plan would call for systematic development, the least possible drilling expense, a thorough drainage for the best ultimate recovery, a complete testing of the likely productive area and an excellent plan for protecting the royalty owner. Such a development program will eliminate the duplication of strings of tools, will allow operators to rotate material and eliminate much expense that commonly goes with boom drilling. The experience that one company had in getting eight dry holes at Bowlegs field in a single day proves the waste expense of simultaneous drilling of a large number of wells close together.

A meeting was held December 6 in Oklahoma City, among those holding acreage, including, T. B. Slick, W. R. Ramsey, Ramsey Petroleum Corporation, Wirt Franklin, Joe Cromwell, and representatives of Coline Oil Company, Indian Territory Illuminating Oil Company and Foster Petroleum Company. These operators agreed to hold back drilling development, and no outbreak of drilling is anticipated. The operators agreed to limit drilling to one well per 40-acres, with the well to be located in the center of the tract. Nothing was said about pinching in the production of completed wells, nor the number of wells that could be started.

Some immediate drilling will result. Ramsey Petroleum Corporation has made a location for Fortson 1, C SW NE Section 24-11-3w, and Coline Oil Company has made location for the west offset in C SE NW Section 24-11-3w. Hall and Briscoe, of Chickasha, purchased 60 acres in SE of Section 10-11-3w, approximately two miles west and north of the Indian Territory well. They also bought 10 acres in SE NW NW of Section 14-11-3w. They are expected to start drilling on this tract soon.

Indian Territory Illuminating Oil Company has pumped mud into its No. 1, C SE SE 24-11-3w, six miles south of Oklahoma City, to shut off the oil flow and was ready to drill ahead with the Wilcox sand as its objective. Some fear is being expressed over its possible outcome in the Wilcox sand. Failure to find production in that formation would retard to a large extent the development anticipated as a result of its present big flow, since more than half of the tests drilled in the state have the Wilcox sand as their objective, due to its stability and large production of high gravity oil.

Pipe line crews are at work on a short line from the new deep producer to the loading racks of the Home Oil Refinery Company southeast of Oklahoma City. This is expected to be ready by the time drilling is resumed on the producer.

To Move By Tank Cars

Empire Oil & Refining Company at Bartlesville has contracted for the discovery production. The crude will be moved out in tank cars until a line can be constructed to the Crescent-Lovell area in Logan County, where it will connect with the Empire Pipe Line Company's trunk line. Complete details on the line construction have not been worked out, but construction is expected to start as soon as possible.

G. W. Turley, owner of the Home Refinery, will reconstruct his 1000-barrel plant and put it in shape for handling crude. It has been shutdown for several years.

Eight thousand barrels of steel tankage was ready when the well blew in. Immediately other tanks were rushed from Seminole. Two days later the flow had practically caught up with the tank builders and it was necessary to curtail the output of the well, until more tanks cauld be finished.

Leases Take Upward Trend

Lease values throughout western Oklahoma took a decided upward trend with the news of the big well, as did those between the McCully and Greater Seminole districts. Royalty a quarter of a mile from the producer changed hands at a consideration of $4500 per care and it is said that royalty under the well cannot be bought for less than $7000 per acre. There is little trading in leases around the well because it is tightly held by large interests, however, many other concerns are willing to pay big prices to get in, and in the near future a few deals may be consummated. Cleveland County, lying immediately south of the discovery well, was the first to feel the improved leasing condition. All free leases were being taken by individuals and major oil companies.

The gas flow from Layton sand in the discovery well had a rock presure of 1720 pounds which is one of the greatest ever encountered in the Mid-Continent oil region. Indian Territory Illuminating Oil Company and Foster Petroleum Company are drilling another test to this gas pay. It is Trosper 1, in Section 13-11-3w, about one mile north of the discovery well.

The gas has a high value because of its closeness to Oklahoma City where it should find a ready market among the industrial plants as fuel. The Trosper Park well is now below 3100 feet. Should it find the same big gas it will determine the existence of a big gas producting structure.

Geology Uncertain

The present producer will be drilled to the Wilcox sand. The exact identification of the present big pay formation has not been determined. There are several theories. A study of the log shows that it has found no Sylvan shale. The Sylvan has either erroded entirely, or has not been penetrated. Upon the determination of this fact depends the identification of the producing horizon.

If general opinion, which has it that the well is in the Simpson sand from 6357-6402 feet, with the oil coming from the bottom of the hole is true, the Sylvan has eroded away and the well is running high, indicating that it has an excellent chance of finding production in the Wilcox sand. Several well known paleontologists are of the opinion that the well is producing from a soft spot in the Hunton lime, and that the Sylvan and other formations will be found running regularly beneath the Hunton. It is pointed out that wells drilled north of Oklahoma City found these lower formations running regular. In this event the well is not running high and its opportunity for production in the Wilcox sand is materially lowered. Deepening to the Wilcox sand will be of outstanding geological interest. Deeper drilling may clear up the mystery regarding the present producing formation when the lower horizons have been encountered. It may be necessary for other wells to be drilled before geological knowledge can be final.

The Oklahoma City wildcat play stands out as one of the largest financial wildcat ventures in the history of Oklahoma oil development. The increase in acreage and royalty values during the course of drilling of the discovery well is unusually interesting. The discoverers acquired the bulk of their holdings before activity started, and several thousand acres were obtained at around $1.25 per acre. Five dollars an acre for leases was considered top prices before competitive leasing started with Sinclair Oil & Gas Company paying $77 an acre for a quarter section on school land under the bidding system. Following this purchase the Indian Territory Illuminating Oil Company paid above this price for acreage adjoining previously purchased leases for under five dollars. It is understood the discovery companies paid only $200 an acre fee for the producing forty.

Sedgwick County Production Coming from Chat Formation

WICHITA, Kansas. — Marland Production Company's Goodrich 1, wildcat discovery well completed early last week in Section 16-25-1e, six miles northwest of the Wright field of Sedgwick County, flowed 2125 barrels in 12 hours Monday after cleaning out several hundred feet of cavings to within 50 feet of bottom, 3020 feet. Tankage erection is being rushed and plans for a pipe line to handle the oil being worked out.

The well failed to flow when opened up Sunday night, because of 450 feet of open hole, and cavings in the hole that probably shut off the production. The well blew in while drilling in an eight-inch hole.

The producing horizon is now said to be a chat formation, which materially lowers it in the estimation of oil men. Chat formation has often times been the scene of apparent big wells, but their history has been that the oil is soon blown out, and that they make but small wells.

If the Goodrich performs as did its predecessor chat tests, it will probably be drilled to the Wilcox sand imediately after thorough testing. Chances of finding Wilcox sand production are also thought to have been materially lowered by the identification of the producing horizon as chat, since most of the wells that locate big initial production in the chat have been unsuccessful in finding Wilcox sand oil.

Final outcome at its present depth will be highly interesting and important as will its record if deepened to the Wilcox sand.

This well, Goodrich 1, unexpectedly encountered the producing horizon, and no preparations for handling a large recovery had been made. Oil blew to the top of the 84-foot derrick after sand was penetrated at 3010-20 feet. The column of crude settled to about 15 feet above the derrick floor, and was brought under control within about six hours. Estimates on the output of the well ran from 5000 to 7500 barrels. The hole is eight-inch. The flow started when tools were removed for running six-inch casing.

No production was expected before Wilcox sand, estimated at around 3300 feet, depth of the Wright pool to the southwest. No cuttings were obtained of the producing formation and its identity is unknown. Many geologists have expressed their belief that the Mississippi lime has erroded away, and that the producing horizon is either the Viola lime or Wilcox sand. It is reported that the pay is a sand formation, indicating that it might be the Wilcox. The horizon might be either the Bartlesville or Burbank sands, however.

The producer is now entirely shut in awaiting erection of tankage, and building of a three-inch line from the Wright pool by the Derby Pipe Line Company. Until it is connected no actual gauge of its producing capacity is possible. Marland Production Company plans construction of a 50-mile line to Oxford at a cost of $1,000,000.

Marland Production Company owns a solid 3560-acre block, surrounding the well. The fact that one company controls the new pool thwarts the idea of a tremendous drilling campaign in the immediate vicintiy. The company is anxious to build up its crude production, however, and will probably start a few additional wells immediately.

The third well completed in the county is the Marland Production Company-Gypsy Oil-Buvibar Petroleum Company's Lyon 2, NWc SW SW Section 7-26-1e. It is estimated as a 1000 barrel well from 3353-57 feet. It probably will be deepened further into the pay for a probable increase in production. Lyon 2 is the farthest south producer in the Wright pool, being one location south of Lyon 1, which is the east offset to Wright 1, discovery well.

The fourth well in the Wright pool, located south of the Goodrich strike, has been drilled in. It is Marland-Gypsy-Bu-Vi-Bar Companies' Lantz 1, NEc SE SE 12-26-1w, south offset to the discovery well. It is making about 30 barrels per hour from 3363-67 feet. The pay formation was encountered considerably lower than in the Wright discovery well.

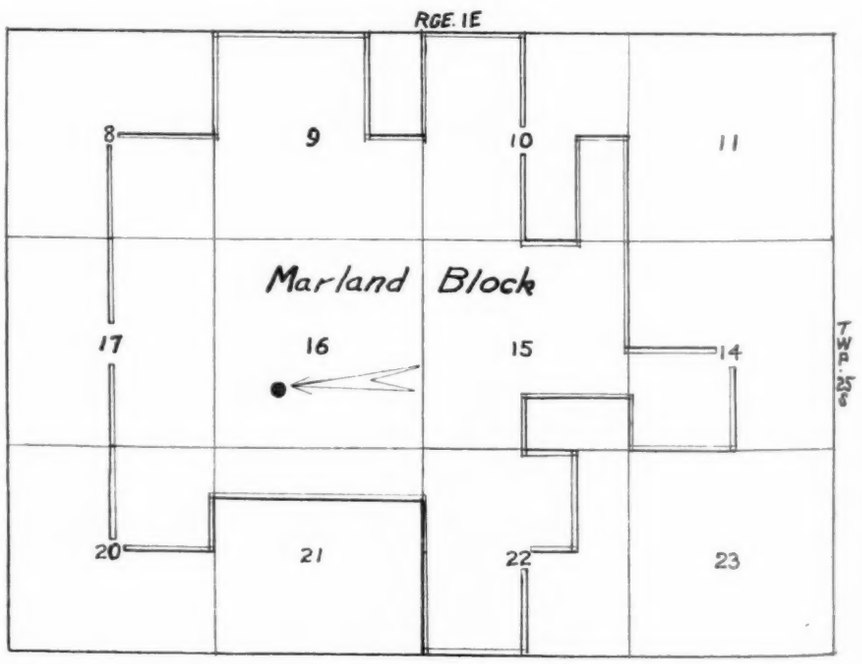
Mary Jane Oil Company's Fitch 1, NWc SE SW 6-26-1e, three-quarters of a mile northeast of the Wright pool production, has 1500 feet of oil in the hole at 2573 feet. This is in the top of the Kansas City lime. Marland-Gypsy-Bu-Vi-Bar Companies' Wright 1, encountered a similar showing at this depth. The pipe has been run and the test is drilling ahead with the Wilcox sand as its objective. It is running high and considered to have an excellent chance of finding production in the Wilcox sand.

Marland-Gypsy-Buvibar Companies own more than 3200 acres in the vicinity of these wells, including all the immediate offset acreage, although this block is not entirely solid. Marland Production Company owns one-half interest, Gypsy Oil Company two-fifths, and Bu-vi-bar Oil Company one-tenth interest.

The total production of Sedgwick County will be better than 10,000 barrels daily when the Goodrich well is placed on production and will increase with the completion of the anticipated well in the Wright field. Sedgwick County is expected to take the lead as a producing county in the state within a few months. At the present time Greenwood County leads with a recovery of approximately 30,000 barrels daily, followed by Butler, Sumner and Cowley Counties.

Sedgwick County received its first oil production early in August when Marland-Gypsy-Bu-Vi-Bar Companies drilled in Wright 1, Section 12-26-1w, discovery well of the Wright pool. This well made as high as 1800 barrels in one day. Since this time the county's recovery has increased to its present output of more than 10,000 barrels per day. Some 30 dry holes have been drilled in Sedgwick County during the past 15 years, without a producer.

A competitive leasing campaign running north from Sedgwick County, into Harvey, thence into McPherson County has featured this district since the strike of the Wright producer. The new Goodrich producer and other wells add momentum to this play.



Marland Production Company's block around the late strike in Sedgwick County, six miles northeast of Wichita, Kansas.

Hendrick Mid-Section Yields Large Completions

One well has initial yield of 50,000 barrels; Ward and Pecos County wildcats maintain initial output

By H. H. KING
Staff Representative

SAN ANGELO.—The mid-section and south end of the Hendrick field contributed a large quota of big wells within the past week, including one that is rated at 50,000 barrels daily. However, small producers predominate in the number of new completions in the field and actual field work is tapering off, despite the revival in activity caused by recent extensions to the south.

Rotary drilling contractors that have been counting on sufficient new work being launched in O'Brien and Llano-Daugherty pools to offset the normal decline in drilling in the Hendrick field, are meeting with disappointment because of operators in the former two Winkler County areas holding back unnecessary development until the trend of production is more definitely outlined.

The Llano-Daugherty pool, located in North Winkler County, has made a poor start in fulfilling expectations of becoming a major source of crude, and a sharp dip in the structure to the northeast of production was indicated early this week when Empire Gas & Fuel Company's Daugherty one "B" failed to encounter the big lime when carried to 2800 feet, or about 150 feet lower than the average lime top on nearby completed wells. This test is credited with having passed through the main salt body at 2750 feet.

Atlantic-Kessler-Logan's Daugherty 2, located in the northeast corner of the discovery lease, is trying to kill a sixty million foot flow of dry gas at 3140 feet to deepen.

Magnolia Petroleum Company's Scarborough 1, located east of the original Llano pool pumpers, made a 10-barrel flow of oil last week after recovering tools at 2840 feet, and early this week was reported with 800 feet of oil in the hole.

Drilling out cement plug in Barnsdall Oil Company's Morton 1, a northeast offset to the O'Brien pool discovery well, was scheduled for the fore part of this week after standardizing at 2884 feet. This test is running low on structure.

Gulf Production Company is cementing pipe above the salt on its two tests on the O'Brien ranch, while Simms Oil Company, Prairie Oil & Gas Company, Marland Production Company and Wentz Oil Corporation are making slow progress on their nearby tests.

Big Wells

Atlantic Oil Producing Company's Hendrick 5-E, located in the northeast corner of Section 41, Block B-5, carried off high honors among the group of big wells completed in the Hendrick field during the past week, with an initial flow estimated at 50,000 barrels daily from regular lime at 2580-2667 feet. This producer is a twin location to a test junked last August while in big gas at 2200 feet, and has had direct offset drainage from three sides for many months. In the 160-acre lease to the north, Pure Oil Company recently completed Hendrick 10-C, rated good for 20,000 barrels daily at 2601-18 feet, while Pure Oil Company's Hendrick 9-C was bailed in late last week from pay at 2545-66 feet estimated good for 12,000 to 20,000 barrels daily. The above trio of big producers are located about mid-section of the field, and encountered the big lime near the 2200-foot level, thus being among the shallowest oil producers in the field.

The south end of the Hendrick structure shared in the big production when Prairie Oil & Gas Company's E. W. Cowden 2, 1650 feet north and 300 feet east of the southwest corner of Section 3, Block 12, gauged 1005 barrels of pipe line oil per hour from lime at 2725-2960 feet, with big pay at 2950-60 feet. This well logged the top of the big lime at 2518 feet, with a surface elevation of 2770 feet, and proves that the south end is open for further extensions. Prairie Oil & Gas Company's Cowden 3, located in the northeast corner of the above 80-acre lease, drilled pay at 2843-70 feet, and blew out rotary mud with an initial flow of 200 barrels of oil per hour. Southern Crude Oil Purchasing Company and R. A. Westbrook's Hendrick 3-B-T-88, located in the northwest corner of Section 4, Block 12, and southwest of the proven area, was reported to be flowing 600 barrels of oil per hour early this week at 2725-2950 feet, while the same interests' Handrick 1-O-T-88, located in Section 28 and on the extreme north end of the structure, recently tested 180 barrels of fluid per hour, 95 per cent. water from lime at 2738-80 feet, when only 363 feet in the big lime.

Efforts for deep production in the Hendrick field have been abandoned by two more companies after receiving little encouragement from the series of sulphur water horizons found below the regular lime pay. Southern Crude Oil Purchasing Company and Dixie Oil Company's Hendrick 1-B-3-T-67, located in the southwest corner of Section 33, Block 26, and a west offset to one of the biggest producers completed to date, has been ordered temporary abandoned at 3962 feet after cementing five-inch casing because of a flow of 20,000 barrels of sulphur water above. Pure Oil Company's Hendrick 6, Section 41, drilled to 3621 feet before casing was pulled to abandon. The California Company's Hendrick 3 was carried to 3566 feet without favorable results also last August.

Presidio County Wildcat

L. C. Brite Production Company, Marfa, Texas, encountered a small show of oil at 4113 feet while carrying water from above on its wildcat test on the L. C. Brite land in Presidio County, and casing is to be run to make a test at 4152 feet in brown sandy lime formation. This test is using a National machine and was originally scheduled to go to only 2500 feet. This test is located at the center of Section 50, Block 12, G. C. & S. F. Ry. survey.

Flowing wildcat oil producers recently completed in Ward and Northwestern Pecos Counties continue to maintain their output at the initial flow, but offset lease owners have lagged in starting tests. These two wildcats are making a better grade of oil than usually found in this section of West Texas. However, a market outlet for the oil has not been provided. Geo. Anderson and associates wildcat test on University lands, located near center of Section 11, Block 17, Pecos County, is preparing to make test of show of oil with water found in hole at 1879-90 feet after standing idle at 1880 feet since early last May. This wildcat developed a show of gas at 1320-25 feet, and the sulphur water is coming from the 1770-foot horizon. It is credited with having logged the big lime at 1715 or 1760 feet, with a surface elevation of 2801 feet.

Bell to Head Humble Personnel Department

Houston.—H. E. Bell, former chairman of the Oil & Gas Division of the Texas Railroad Commission, will join the Humble Oil & Refining Company shortly as head of the personnel department. Announcement of the establishment of this new department within the company was made December 10, when the Humble Club held its third annual banquet.

J. M. Monhghan of the Humble Pipe Line Department was elected president of the Humble Club which has approximately 400 members. J. A. Collerain was elected vice president; F. M. Hughes, secretary; and H. E. McDonough, treasurer.

Deep Big Lake Well Increases Oil and Gas Flow

BIG LAKE, Texas.—Registering a steady gain in oil and gas flow, the world's deepest well has been given a temporary completion by Texon Oil & Land Company, because of the gas production making it impossible to continue drilling in the five-inch hole at a total depth of 8523 feet. This well gauged 674 barrels of 53 (corrected) gravity oil and 10,500,000 cubic feet of gas during 24-hour period ending Tuesday morning, with a small volume of oil and gas coming from lime pay passed up at 6284-99 feet, where 41.7 (corrected) gravity oil was encountered in June, 1927. This deep pay is generally believed to be from the upper series of the Pennsylvanian formation, and is expected to have considerable thickness.

The deep producer was reported last week as flowing by heads at the rate of 260 barrels of 44.7 gravity oil daily and six million cubic feet of wet gas, both free from the usual sulphur contamination found in most West Texas crudes, and the gravity of the oil increased about 10 degrees without deepening the hole. However, a gain in the gas flow accompanied the rise in gravity, while the column of oil carried in the hole from the 6284-99-foot pay may have held down the gravity on the early tests made on the oil from the deep pay.

The well is known as University 1-B, Group 1, being located in the northwest corner of the southwest quarter of Section 36, Block B-9, Big Lake field, Reagan County, and is credited with having cost its owners less than $200,000, while other tests to be drilled to this new horizon are expected to be completed for about $125,000. University 1-B encountered the top of the deep pay at the 8500-foot level (corrected measurements), and the last string of casing consists of 5-3/16-inch pipe cemented at 6184 feet. The oil is being sold on contract in the Big Lake field to the Reagan County Purchasing Company, at the average Mid-Continent gravity scale price, and because of the best price available being $1.76 for 44 gravity and above, the deep oil is being mixed with the 36-39 gravity oil produced by Texon from the upper pays in the field.

Rich Gas

The gas production from the deep well is credited with having a recovery of about two gallons of natural gasoline per 1000 cubic feet, and since this gas is free of sulphur, the gasoline plant operating on Texon Oil & Gas Company's property is switching to it. Complete details of the equipment used in drilling this deep producer; formation log to 8230 feet; and miscellaneous data was published in the September 14, 1928, issue of The Oil Weekly.

Several more deep tests, including the one now underway by the Big Lake Oil Company, are to be drilled in the Big Lake field, while the performance of the University 1-B will influence operators in other West Texas fields to try for production in the Pennsylvanian formation. Texon Oil & Land Company's University 61, Group One, located about half mile due south of the deep well, was carried to 3900 feet some months ago, but shut down to await the outcome of the University 1-B.

Big Lake Oil Company's initial try for deep production in the Big Lake field is known as University 151, and located 2310 feet south and west of the northeast corner of Section 1, Block 2, or about one-half mile west of the Texon Oil & Land Company's deep producer. This new deep test encountered a fishing job last week while drilling in heaving sand at 2640 feet. In the event the high point of the structure producing oil and gas from the 8523-foot level conforms with the high level of the 3000-foot regular pay, the Big Lake Oil Company's test should make a larger well, as it is located near the center of the field.

Big Lake Oil Company officials anticipate an expenditure of about $125,000 in making a producer from the new pay, according to Levi Smith, president of the former company. However, this estimate does not allow for serious mishaps in drilling. B. L. Agnew & Sons, drilling contractor, is drilling the Big Lake Oil Company's test with cable tools on a cost plus basis. The rotary has been tried on several occasions in the Big Lake field without satisfactory results, except when penetrating the 300-foot layer of heaving sand encountered at about 2400-2700 feet.

Comparatively little casing is needed in drilling for the deep pay, as the last water horizon is encountered at about the 3470-foot level, and hard black lime and shale follows to the top of the 8500-foot pay. Mr. Smith advises that his company's deep test will try and set 8¼-inch casing below the last water horizon, and the next string on top of the 6284-99-foot pay, thus leaving the five-inch string to on or above the lower pay. Most of the large pipe can be pulled when the eight-inch casing is cemented.

Shell Completes Small Well at Ventura

Ventura, Calif.—The Shell Company has completed Gosnell 27, in the Ventura field with an initial production of 700 barrels from 7125 feet, giving the company one of the smallest producers it has finished in some time. Unlike many wells completed recently, Gosnell 27 did not show a steady increase for several days after completion. The first cut was above 50 per cent. but this figure has been reduced.

S. R. Dresser Manufacturing Co. Reorganized and Refinanced

BRADFORD, Pa.—Reorganization of the financial structure of the S. R. Dresser Manufacturing Company, which for many years has been actively identified with the natural gas business through the manufacture and sale of the well known Dresser Couplings, has been made following the purchase of the stock of the company formerly held by those who have been connected with the company. Under the new plans, complete details of which have not yet been announced, Fred A. Miller will become the chairman of the board, W. Frank Miller will become secretary-treasurer and Merrill W. Davis, formerly sales manager, will become vice president. Hamilton Pell of New York has been added to the board of directors; James P. Clark has been reappointed superintendent of plant, otherwise the personnel remains unchanged.

The original Miller stock has been bought by W. A. Harriman Company of New York. Under the new capital structure, 100,000 shares of Class A stock have been issued, which will be preferential as to dividends and which will be convertible into Class B. stock. The Class A stock, which has no par value but which has been put on at $48, will be preferred as to dividends up to $3 a share. Then, after Class B stock has received $1.50 dividends, the Class A will be participated in additional dividends to the extent of $1, after which dividends accruing from operations will all go to Class B stock. The Class A stock can be retired by call at $65, but Class A stockholders have the right to convert it to Class B stock up to 10 days prior to the retirement call. For this purpose, in addition to the 100,000 shares of Class B stock now to be issued, an additional 100,000 shares of Class B stock has been authorized but will not be used except to retire Class A stock, which means that under the present plan there will not be more than 200,000 shares of stock outstanding at any time.

An aggressive sales campaign will be undertaken to industries which in the past have not received a great deal of attention at the hands of the company.

Santa Fe Springs' Intermediate Zone Given High Rating

Getty well which ran wild for two months is holding to increased flow of 6,000 barrels daily; Buckbee zone cuts cause concern

By BRAD MILLS
Staff Representative

LOS ANGELES.—The steady performance of the intermediate zone, a slightly higher cut in some of the Buckbee producers and the inability to complete two wells in the Buckbee zone were the outstanding developments of the week in the Santa Fe Springs field. It is still too early to reach definite conclusions from any one of several important developments, but it now appears that the intermediate zone will come to the rescue of the Buckbee formation, in the event the latter falls far short of early estimates, and that the southeastern part of the field will produce more uniformly than the northwestern section. The increase in the cut of at least two wells is viewed with some alarm, but the mischief may eventually be traced to leaky casing shoes, rather than to an actual encroachment of water from the main body of sand. The failure to complete two wells is also attributed to faulty water shutoffs above the Buckbee zone and not to bottom water. Lack of completions makes it difficult to place the poor showing to any specific cause, however, and many more wells will be required to clarify the puzzling situation.

The best well of the week was the Universal Consalidated Oil Company's Blanchard 8, which was completed with an initial production of 5500 barrels from 5740 feet. The oil was 35 gravity and showed a cut of only one-tenth of one per cent. This well is located southeast of what is regarded as the center of the field and is the fourth completion in the immediate area by the company. All of the wells have been large producers, giving the Universal Consolidated Oil Company by far the largest production from the Buckbee zone. This area was very prolific in the Meyer zone and the same condition has uniformly applied in the Buckbee sand. The Company's O'Connell 3, completed a week ago on a lease nearby, is producing more than 5500 barrels. This well is the farthest to the southeast completed to date and its showing indicates a large production in this tip of the field.

Completion of Shell Company's G. H. N. 13 as a 3100-barrel producer gives the northwestern part of the field the first boost it has had since the deepening campaign. Profiting by its experience in another well, the company included only a small amount of sand below the shoe. The result was a cut of only three-tenths of one per cent, showing that the top of the Buckbee zone may produce clean oil almost to the limidts defined by the Meyer sand. The oil was 35.4 gravity, disclosing no indication of an edge condition.

Bellview Oil Company's Grohs 2, which ran wild for three weeks after catching fire, has settled to 2750 barrels of oil and 32 million cubic feet of gas. This well is located near the center of the field, but cored gray sand in the bottom of the Buckbee. This is the first instance of grey sand near the center of the field. The well was plugged back, however, and is now producing with only a trace of water. In flowing wild, the well did great damage to both producing and drilling wells nearby, more than two dozen wells having been idle at one time.

McKeon Drilling Company will kill its Y. and L. 1, which declined rapidly after the Bellview Oil Company's Grohs 2 burst into flames. Located only a short distance from the burning well, Y. and L. 1 dropped from 3000 barrels to 1000 barrels during the duration of the fire, and has since declined to 700 barrels. Additional hole will be made to eliminate the effects of the untimely drainage.

Associated Oil Company's Jordan 2 continues a steady decline of about 100 barrels per day, present production registering about 4000 barrels. This well was an unusual producer, however, coming in with an initial production of 6800 barrels, and a decline was expected.

Disappointment accompanied the attempted completion of General Petroleum Corporation's Santa Fe 168C. The well flowed more than 1500 barrels in nine hours, but the fluid showed a cut of 50 per cent. The water seems to have entered the hole around the shoe. The well was drilled to 5696 feet, with only 46 feet of sand open below the final shutoff. With such a thin body of sand cut, there is little doubt but that the well will make a clean producer.

Associated Oil Company placed Jordan 3 on a production test, but the well sanded up after flowing 250 barrels in little more than an hour. Starting off like a real producer, the well had all the ear marks of a 5000-barrel well. The hole is being cleaned out, preparatory to another production test. The well was drilled to 5748 feet, with 106 feet of the Buckbee zone included in the test.

The increased cut of The Texas Company's Matern 2-7 is causing considerable concern, the latest figure showing about 14 per cent. water. The well acts as if the water is coming around the shoe of the water string, but there is no definite way of determining this. The well started showing a very small cut and has made a gradual increase in the percentage of water for more than two weeks.

George F. Getty's Nordstrum 17, which has developed into the champion producer of the field, is flowing 6200 barrels from the intermediate zone. By flowing wild for more than two months, this well seems to have opened up a number of channels. When first brought under control, production was only 4500 barrels, but after the pressure found a settling point, the yield increased to above 6000 barrels. The remarkably steady production, after such a hectic experience, is little short of marvelous, and gives the intermediate zone a very high rating.

The Shell Company's Slusher 12, first tested in the top of the Buckbee zone and deepened more than 100 feet without coring, is producing 2100 barrels and showing a cut of nine per cent. The well was plugged back to include only 30 feet of the formation.

Production from the Buckbee and intermediate zones now totals 55,500 barrels from 16 wells. The field total is 83,000 barrels. Eleven wells are coring in the intermediate zone, three are cemented over the intermediate zone, five are coring in the Buckbee zone and 13 are cemented over the Buckbee. The total number of drilling wells is 232, with 16 active locations.

Associated Completes Second Potrero Well

Los Angeles.—The Potrero field, right at Los Angeles' back door, is again attracting wide attention, following the successful completion of a 1100-barrel well by the Associated Oil Company. The new producer is Cypress 3, which came in from 4650 feet. The oil is 46.3 gravity and shows a cut of about three per cent. The action of this well confirms the theory that the field will extend toward the northwest, possibly into the city of Inglewood. Oil sand was found from 3300 feet to the bottom of the hole, but only 140 feet was included in the final test. The well is flowing through a 28/36-inch bean, with a tubing pressure of 550 pounds and a casing pressure of 75 pounds. The Associated Oil Company had drilled five wells in the Potrero field but was unable to complete but one satisfactory producer—Cypress 2, which came in with an initial production of 1000 barrels and is now making 350 barrels of 48 gravity oil.

Kettleman Hills Producer Proven No Freak

Coalinga, Calif.—The action of the Milham Exploration Company's Elliott 1, discovery well of the Kettleman Hills field, eliminates the producer from the freak class and places it in a group all by itself, as far as California fields are concerned. After producing steadily for more than a month, the well is still yielding 4000 barrels of 60 gravity oil and 45 million cubic feet of wet gas. It requires four huge gas traps to handle the production. The oil is considerable lighter than commercial gasoline and contains less than 12 per cent. of kerosene and heavier fractions. The depth at which production is obtained —7108 feet—places the field in a very expensive class and eliminates the area as a large producer for more than six months.

It now seems that the General Petroleum Corporation just missed discovering the field by its failure to make a test at points where the tools were blown from the hole. The company considered the blowouts from a gas angle only and accordingly sealed off the flow of gas where possible. Some oil was in evidence but it was so light that it was not identified as the quality expected. The General Petroleum Corporation has succeeded in cleaning out Oschner 2 to 6375 feet and expects to reach the old bottom soon. With such a start, the well should be the next completed.

Petroleum Securities Company is becoming active in the area, having already acquired additional acreage. The company will drill at least three wells within the next few months.

Standard Oil Company, already the owner of several large leases in the district, has acquired all of Section 10-22-17, with an agreement that a well would be started within three months. The company has completed a rig on Section 11-22-17 and has staked a location on Section 1-22-17.

Los Angeles Basin Area Has Drilling Slump

Los Angeles.—The sudden rise of the Long Beach field, followed closely by the re-development of the Santa Fe Springs field, has reduced drilling operations in the settled fields of the Los Angeles basin to a very low figure. Huntington Beach, Brea - Olinda, Montebello, Inglewood, Richfield, West Coyote and Torrance are extremely quiet, with no immediate prospect for a general revival. An occasional deepening job and the drilling of perhaps 25 wells account for the activity in these fields. Richfield and Seal Beach, regarded as the newer of the settled fields, are the most active.

The number of active wildcat tests in the Los Angeles basin is much smaller than at the same time last year. The smaller companies were affected most by the shutdown movement. The major companies are continuing with their most important wildcats, and occasionally a new one is located. The lack of capital and the increased production in the critical fields have handicapped the small companies drilling in favorite spots near the small towns of the Los Angeles basin. The Associated Oil Company is drilling at 5175 feet in Taylor 1, a test near Downey and about four miles northwest of the Santa Fe Springs field. The Texas Company has passed 2000 feet in Crawford 1, located near Garden Grove and in an area which has been drilled but little. Richfield Oil Company has not spudded in its wildcat near Maywood and just east of Los Angeles.

Los Angeles Geologists Have Two-Day Picnic

Los Angeles.—Geologists of Southern California met Friday and Saturday, December 7 and 8, at the French Ranch, nine miles west of Triunfro, for an annual picnic, outing, get-together meeting or whatever you want to call it. Unique circulars were issued announcing the affair. The committee in charge of the meeting was composed of Roderick Burnham, Robert B. Moran, B. N. Ferguson and Harry R. Johnson.

Fifth Well Finds Sand in Elwood Field

Santa Barbara, Calif.—Rio Grande Oil Company and the Barnsdall Oil Company, joint operators in and principal owners of the new Elwood field in Santa Barbara County, have tapped the oil zone at 3175 feet in Luton-Bell 3, disclosing a very favorable structural condition in the fifth test to encounter the sand. A string of 11¾-inch casing has been cemented and a production test will be made within a week. In finding the oil sand at such a depth in the well, a good producer is indicated. The three wells completed by the two companies are still producing 10,000 barrels of 38 gravity oil, with no trace of water. Elwood-Acres 1, located more than a mile from the discovery well and regarded as a wildcat test, is in difficulty, with a liner hopelessly lost in the hole. Additional hole was made below the point at which the well was recently tested, but little progress can be made until the liner is sidetracked.

Bankline Oil Company is drilling below 4300 feet in A. and D. 1, a test which is expected to find the sand above 4500 feet. This well is regarded as an important test, since its outcome will have an important bearing upon future developments on several leases nearby. The sand is expected at about the same depth as the formation was found in Elwood Acres 1, mentioned in the first paragraph.

Rincon Conditions Far From Satisfactory

Ventura, Calif.—The Rincon field continues a keen disappointment in both the upper and lower sands, notwithstanding a production of about 5000 barrels from 25 wells. The discovery well indicated that the field would soon become a major factor in California oil circles, but extensive drilling has disclosed a very unsatisfactory condition in both the upper and lower zones, if the formation around 6500 feet can properly be called a zone. An occasional completion at any point between 3000 and 4100 feet is effected, but production is invariably below 1000 barrels, and generally nearar 500 barrels. The decline is rapid, settling to around 200 barrels after a few weeks. The absence of a zone of sufficient thickness to yield large wells has been conspicuous and the chief reason for such a small field production after a year.

Some of the outpost wells have cored thin bodies of oil sand and extensions are probable. At least one small structure has been worked out so near the Rincon field that it probably will be included in the original area if production is obtained. The limited development along the rugged edge of the main field is proving a handicap to further exploration. Petroleum Exploration Company has cored several streaks of oil sand below 4900 feet in Hawkins 1 and has set a string of casing for a test. Other outpost wells have reported oil and gas showings.

Richfield Oil Company has been unable to remove the bailer lost in Hobson 1, adding another element of doubt to this deepest of all wells drilled in the field. The well was recently tested at 6530 feet but flowed water and only a little oil. The gas pressure showed that it might have been possible to make a producer of the well if a satisfactory water shutoff could be effected.

Seal Beach Wells Revive Drilling Prospects

Los Angeles.—Recent completion of two good wells in the Seal Beach field promises to gradually revive drilling operations in the area as soon as more critical fields are out of the way. Some of the operators are still of the opinion that the deep sand in the Alamitos Heights or townlot sector is better than completions to date indicate, but the risk and expense involved do not warrant a resumption of extensive operations at this time. The main part of the field, which has been conservatively developed by the Marland Oil Company, Associated Oil Company and the Standard Oil Company, will be drilled only when the oil is needed. The townlot section of the field is now producing only 10,000 barrels, as compared with almost five times as much at this time last year.

Greater Seminole Output Reaches New Low Level

New wells in Maud area puts that field ahead of Searight as fifth in list of pools; water intrustion in Wilcox increasing at St. Loxis

By WARREN BAKER
Staff Representative

TULSA.—Completion of several new wells in the Maud district increased the output of that region to 11,720 barrels, which enabled it to go ahead of the Searight field as the fifth ranking pool of the Greater Seminole area. Production of Maud continued to hold around 11,500 barrels daily during the remainder of the week, with an expected increase with other wells due to be completed immediately.

The most interesting developments at Maud centered around the Wilcox sand discovery of Barnsdall Corporation on the Fife farm, in Section 14-8-5. Sinclair Oil & Gas Company's Harjo 1, SWc SE Section 11-8-5, north offset to the original well, swabbed and flowed 1044 barrels in 24 hours from Wilcox sand at 4308-13 feet. The discovery producer, and only other Wolcox sand well at Maud, made 1365 barrels.

Failure of these two wells to produce more caused operators to believe that they are edge wells. Indications are that they are on the east edge of the producing structure. One-half mile east The Texas Company drilled a test to the Wilcox sand at 4730 feet and found water. To the northeast one and one-quarter miles, Prairie Oil & Gas Company found a failure at 4623 feet. This well is in the northwest corner of Section 12-8-5, with The Texas Company well in the southeast corner of the same section. This belief was further strengthened last week, when Gypsy Oil Company penetrated the Wilcox sand at 4480 feet with Mimey 1, NWc NE Section 14-8-5, east offset to Fife 1, and and got 3000 feet of water at five feet in the sand.

Apparently the Wilcox sand producing structure at Maud will be egg-shaped, running to the west of the discovery well. Indian Territory Illuminating Oil Company's Simpson 1, SEc NE Section 10-8-5, northwest one-half mile from production, found production in the Simpson and upper part of the Wilcox sand, with water beneath. It was completed for a small well, and production is expected to extend to this location. To the west is McMan Oil & Gas Company and White Eagle Oil Company's Roberts 1, NEc SW SE Section 9-8-5. This test is in the Sylvan shale. It is running low and will probably be a failure in the Wilcox sand. Indian Territory Illuminating Oil Company's School Land 1, SEc SW Section 16-8-5, which had an experience similar to the same company's Simpson 1, is two miles to the west and slightly south. Production should be found between the two wells. These wells seem to pretty well define the present Wilcox sand pool except to the south. The only marker in this direction is the Indian Territory Illuminating Oil Company's Ritenover 1, SEc SW SW Section 22-8-5, two and one-quarter miles from the discovery producer. This well failed in the Wilcox sand.

Tulsa.—Greater Seminole fields reached a new low production level Decemebr 11, since opening the area October 1, gauging 277,077 barrels. Production by fields follow:

Field—	Wells	Production
Little River	309	89,195
Bowlegs	312	46,865
Mission	12	1,247
Maud	12	11,956
Earlsboro	290	76,191
Seminole City	282	41,948
Searight	67	10,175
Total	1,284	277,077

St. Louis field gauged 135,098 barrels from 269 wells December 11.

Western Maud District

Interetsing in the etaoshrdluetaoshrdlu Interest in the possibility of Wilcox sand production being found in western Maud district, where the Hunton and Misener formation are proving productive, is centering around the Amerada Petroleum Corporation's Gossland 1, NEc SW Section 8-8-5. This well has passed through the Hunton formation, from which it is flowing 575 barrels daily through a bradenhead, and is still in the Sylvan shale at 4183 feet. It is due to reach the Viola lime.

The test of Empire Gas & Fuel Company on the Cluck farm, SWc NE Section 11-8-5, one-half mile north of the Wilcox sand well of Barnsdall Corporation, was in the Simpson sand from 4130-62 feet, with a show of oil. The Wilcox sand is expected momentarily.

The completions at Maud which sent its production upwards were in the Hunton and Misener area, with the exception of the Sinclair Oil & Gas Company's Harjo 1, Section 11-8-5. They were in the large proven area and of no outstanding individual importance.

Water Increase at St. Louis

Salt water intrusion on producing wells in the Wilcox sand of western St. Louis pool continues to increase. Magnolia Petroleum Company's Cherry 1-A, NE SE NE Section 26-7-4, was doing 4407 barrels daily the past week, which is the largest output of an individual well, but it is cutting 22 per cent. Magnolia Petroleum Company's Cherry No. 1-B, SEc NE Section 26-7-4, has a total depth of 4420 feet, where it is making 1106 barrels, cutting four per cent. Shaffer Oil & Refining Company's Cherry 4, SEc Section 23-7-4, is cutting one per cent. It is swabbing 1036 barrels from Wilcox sand 4330-68 feet. Water apparently resulted in Texas-Fuhrman's Cherry 3, NEc NW NW Section 25-7-4, going dead after flowing 735 barrels in 16 hours from Wilcox sand 4318-32 feet. It has a showing of water.

Prairie Oil & Gas Company's attempt to carry St. Louis production to its Richards lease apparently will be unsuccessful. The test, in SWc SE SE Section 27-7-4, one mile from production in a southwest direction, was found a hole full of water in the Simpson sand from 4245-82 feet. It will plug off the water and drill to the Wilcox sand, but looks unfavorable for production in that horizon.

Wildcat Developments

Phillips Petroleum Company's Sparkman 1, SEc SW Section 15-8-4, west of the Maud district, has found 2800 feet of water in the Wilcox sand from 4644-73 feet. This test created quite a lease and royalty play when it started operations, but the formations have been found running low.

T. B. Slick and Shell Petroleum Company's wildcat in SE NW NW Section 17-7-2, extreme western Pottawatomie County, found the Hunton lime at 5730 feet with a show of oil and gas at 5770 feet. Sylvan shale was encountered at 5772 feet and the test is now drilling ahead at 5810 feet.

Shell Petroleum Company et al's Wyatt 1, Section 17-6-5, north of the town of Konawa, in Southern Seminole, has the Simpson sand at 4135 feet, with a show of water at 4253 feet.

Logan County

Sinclair Oil & Gas Company's Webber 2, Section 18-19-4w, north extension to the McCully field of Logan County, failed to increase production, which is holding at 1875 barrels, after deepening to 6241 feet in Wilcox sand topped at 6095 feet. Twin State Oil Company and J. E. Crosbie's Shaffer 1-A, Section 20-19-4w, north end of the field, is flowing more than 1900 barrels after completing for 2800 barrels the first week in December.

Five New Wells Boost Salt Flat Output

Houston. — Following completion during the past week of five producing wells, there are now 15 producers in the Salt Flat (or Bruner) field on the outskirts of Luling; and the daily output of those wells is over 6000 barrels.

Following are the five wells that were added to the list of producers during the week: Shell Petroleum Corporation's Smith 1 came in flowing 600 barrels from Edwards lime at 2666-82 feet; and the same corporation's Smith 2 was completed for 1200 barrels initial in the Edwards at 2680-2702 feet. Atlantic Oil Producing Company's Davis A-1, which drilled four feet into the Edwards, came in from 2834 feet for 130 barrels. Gulf Production Company's Davis 1 came in as a 100-barrel well from 31 feet of Edwards lime at 2743 feet. Sun Oil Company's Merriweather 2, with the bottom of the hole at 2552 feet in the Buda, came in for 1300 barrels.

Exclusive of these new wells, daily production of the field is about as follows, the figures being the actual production of the various wells on December 7: J. S. Abercrombie's Moses 1, 345 barrels; Cranfill & Reynolds' Smith 2, 749 barrels; Golden West Oil Company's Wilson 2 and 4, 800 barrels Lutex Oil Company's Davis 4, 25 barrels; Lutex Oil Company's Wilson 2, 300 barrels; Sun Oil Company's Malone 1, 567 barrels; Suttle et al's Malone 1, 150 barrels; The Texas Company's Merriweather 2, 1090 barrels; and M. K. Townes' Hickman 1, 132 barrels; a total of 4158 barrels.

More than a hundred derricks are up in the Salt Flat field and around 75 rigs are running.

Magnolia Handles Texas Company Crude to Coast

San Angelo, Texas.—Arrangements have been made by The Texas Company for the transportation of 5500 barrels of West Texas crude daily for a period of about four months through the Magnolia Pipe Line Company's trunk line system to the Gulf Coast on a common carrier basis. Shipments are to be started December 15, and will continue at this rate or more until The Texas Pipe Line Company's trunk line outlet from West Texas to the coast is completed next spring.

Magnolia Pipe Line Company has devoted the bulk of its trunk line capacity out of West Texas to the coast to common carrier business, thus resulting in the Magnolia Petroleum Company accumulating its production and crude purchases in the district, where steel storage facilities completed and building aggregate 9,310,000 barrels. Magnolia Pipe Line Company's West Texas trunk line was increased to 32,500 barrels daily about the middle of September by the addition of loops and station equipment. This line has been handling 25,000 barrels of Winkler and Crane crude daily to the Coast for Atlantic Oil Producing Company, but this movement will cease late this month when the Atlantic Pipe Line Company starts operating its trunk line, which extends from Winkler County, via Midland tank farm, to Atreco, where export terminals are located.

Warner-Quinlan Company of Texas has also contracted for the shipment of a maximum of 7500 barrels of Crane County oil daily via the Magnolia Pipe Line Company line, including about 1,800,000 barrels of storage oil, to Beaumont for tanker movement to refinery at Warners, N. J., but heavy shipments on this contract have been delayed pending the enlargement of the Warner-Quinlan Company's refinery. However, the maximum movement permitted under this contract may be started early next year. A tariff of 52½ cents per barrel applies on this crude movement from Crane County to shipper's tankers.

The Texas Company will deliver West Texas crude to Magnolia Pipe Line Company's Crane County gathering system, although the bulk of these shipments will be from the former's Landreth-Strip lease in the Church & Fields area after the expiration of contracts late this month that Magnolia Petroleum Company has on the oil from this particular property.

Grayburg Oil Company Sold to New York Firm

Houston.—Indiana Oil & Gas Company, a subsidiary of American-Controlled Oil Fields, Inc., purchased the Grayburg Oil Company of San Antonio, a producing, refining and marketing concern operating for many years in South Texas. Properties of the Grayburg Oil Company were reported to be valued at near $8,000,000.

The deal was negotiated between F. L. Thompson, president of Grayburg Oil Company, and Arthur J. Devlin, president of American-Controlled Oil Field, Inc., and S. M. Newton of New York City, president of the Indiana Oil & Gas Company.

Grayburg Oil Company was organized by F. L. Thompson as a producing company in 1918, and started operations in the Somerset field of Bexar and Atascosa Counties. As a producer, the company spread out its activity to include holdings in the Luling field and the Mirando district along the Texas-Mexican border. Later a small refinery was constructed at San Antonio, and a pipe line built from nearby producing properties. Distribution followed the operating of the refinery and the company developed a chain of retail stations through Central and South Texas.

Ludwig Schmidt of the Bureau of Mines will spend considerable time in Oklahoma City during the winter to watch the development in that district.

New Production Level in K-M-A Field

Wichita Falls, Texas.—Holbrook & Woods, Wichita Falls operators, scored the largest producer completed in Wichita County in the past several years when their Kemp & Kempner 26, located in the K-M-A field, swabbed and flowed 740 barrels of high gravity oil during first 24-hour gauge after drilling sand pay at 1470-94 feet. This well made 630 barrels initial when placed on the beam. It adds a new producing horizon for the lease, which has five shallower sand pays, and will result in the deepening of a number of small shallow pumpers. Holbrook & Woods' lease is located in Section 82, H. T. & B. survey, Abstract 139, between the Irrigation Canal and Wichita River.

Indications that the 1400-foot pay may spread over a sizeable area in the old K-M-A field are strengthened by the completion of Coppock & Coleman, Iowa Park operators, Kemp & Kempner 17, which swabbed 480 barrels initial at 1462-82 feet, and Staley-Wynne & Company's Kemp & Kempner 5 with a production of 290 barrels on pump after swabbing 460 barrels initial at 1462-89 feet.

Howell-Somers et al's deep test on the Hirschi farm, located southeast of the Hirschi pool, has set a new record for Wichita County on depth, and is reported to have drilled nearly one mile with rotary. This test is credited with having passed through the big lime at 3820 feet several months ago.

The Panhandle-Daugherty pool, Jack County, was extended about one mile to the northeast last week when the Bryson Oil & Gas Company's Oliver Loving 1 encountered the Strawn sand at 3167-68 feet, and swabbed 20 barrels of oil per hour during a seven-hour test. Panhandle Refining Company's Daugherty 1, discovery well, failed to develop deeper production after drilling to 3890 feet, but made 70 barrels daily when plugged back and shot with 10 quarts at 3032-37 feet. This well opened the pool last April, and was deepened because of production decline in September.

Skelly Plans Aggression in New Mexico

Fort Worth, Texas.—J. P. Cusack, who has had charge of operations for the Skelly Oil Company in Central and West Texas, with headquarters at Fort Worth, is being transferred to Roswell, New Mexico, to open a new district office in connection with the company's plans to carry on a more active leasing and development program next year in Southeastern New Mexico. J. P. Quigley will succeed Cusack as manager of the Fort Worth office, and have charge of Central Texas operations, while E. R. Mosby will represent the company in the West Texas district, with headquarters at San Angelo.

Gulf Coast Field Development Notes

Simms Buys Houma Gas Properties; Will Explore for Oil

HOUSTON.—Charles H. Lane, representing the E. F. Simms Interests, Houston, last week acquired approximately 2000 acres of leases comprising the entire productive area of the Houma gas field, Terrebonne Parish, Louisiana, from Frank Wurzlow of Houma.

This old gas zone, now idle, will in all probability be explored for likely oil pay during 1929, and a program for reviving gas production will be worked out by the purchasers in the near future. Ten gas wells have been drilled in the field, which has yielded more than 5,000,000,000 cubic feet of gas. A conservative estimate following investigation by an engineering company recently placed the future reserve of the field at 30,000,000,000 cubic feet of gas. The last two of the 10 wells drilled had original rock pressures of 1010 pounds, which, after a heavy drainage declined only to 920 pounds.

Houma gas field lies approximately 60 miles southwest of New Orleans. It was discovered by I. N. Knapp, who drilled several shallow tests and then sold the properties to Snyder and McCormick of Shreveport. Commercial gas was developed by these men and was sold to sugar refineries throughout the district and to the city of Houma for domestic utilization through the Terrebonne Gas Company, owners of the gas franchise at Houma. While the latter company is not now actively distributing gas it maintains offices at Houma pending the revival of production in Houma field or other commercial production around the producing field.

While gas has been found in the Houma field at various horizons ranging from 1700 to 3500 feet, the big pay is from a 2300-foot sand, believed by the recent purchasers to be the lateral sands of a deep seated salt dome. A deep test drilled in the immediate vicinity of gas production by Snyder and McCormick picked up an oil show at approximately 4800 feet, but was abandoned as non-commercial.

The Houma field gas develops a turpine distillation, from which indication the operators conclude figure further on the presence of oil. Gas is believed being fed into the prolific 2300-foot sand body from a fracture occuring just above oil pay. The fact that in the salt dome territory gas has never been developed in such quantities except in association with oil further leads operators to expect oil pay at some depth below the strong gas production.

Initial production of the gas producers in the Houma field ordinarily amounted to around 90,000,000 cubic feet with approximately 1010 pounds pressure as stated above.

The approximate 2000 acres purchased by the E. F. Simms Interests includes more than the former producing acreage, and gives the new control the possibility of opening new acreage for production.

Sun Moving Two More Rigs to Salt Creek Dome

Dallas, Texas. — Two more rotary rigs are being moved from Smackover by the Sun Oil Company to supplement the three rotaries now being used to carry on developments around the Clay Creek dome, Washington County, Texas, where the company is in complete control of a shallow flush oil area. A systematic drilling program has been arranged, and a six-mile four-inch line, extending from the pool to tank car rack at Gay Hill, located on the Santa Fe Railroad, will be completed late this month. The crude will be shipped to Sun Station, where tankers will be loaded for delivery to the Marcus Hook plant of the Sun Oil Company.

Sun Oil Company has deepened its Grote 1, which opened the Clay Creek field about the middle of October with small flow from sand at 1140-54 feet, and late last week the crew had reached a depth of 1427 feet, with prospects of making a big producer when bailed. Sun Oil Company's Grote 2, located 688 feet northwest of the discovery well, gauged 210 barrels of 25-26 gravity oil per hour November 12 at 970-1392 feet, and has since remained shut in for storage. H. Witt 1, a northwest offset to this completed well, is rigging up. The shallow oil pay has been missed by tests drilled to the east and west of production, and Marcus 1 is drilling at 2402 feet, while Eimann 1 is drilling at 2428 feet, although both indicate sharp dips in the key formations. A 55,000-barrel steel tank is being dismantled at Lockhart and shipped to Clay Creek by Sun Oil Company as a starter for a tank farm.

Drilling Into Salt Plug Proves South Louisiana Dome

HOUSTON.—Existence of a salt dome at Bayou Blue, Iberville Parish, South Louisiana, has been proved through the drilling of the second test there, Standard Oil Company of Louisiana's Wilbert 1. It was abandoned in salt at 4481 feet.

This test is located 500 feet north and 500 feet west of SEc SW SE Section 74-9s-10e.

Bayou Blue dome was outlined by seismograph in 1926 by the Calcasieu Oil Company, and that company still holds acreage there jointly with Magnolia Petroleum Company and Union Sulphur Company. Outside of the joint acreage of these three companies, the dome is controlled principally by the Standard Oil Company of Louisiana.

The first test of the prospective dome was drilled by allied Magnolia-Calcasieu-Union Sulphur interests, with the Union Sulphur Company doing the drilling. Schwing 1, located 577 feet south and 239 feet west of the center of Section 74-9s-10e, was started early this year, and was abandoned about the middle of February at 2850 feet without having had any important showings of oil or gas, and without finding dome formation.

Following the abandonment of Wilbert 1, Standard Oil Company of Louisiana has made location for Wilbert 2 (A. Wilbert & Sons Lumber Company). It is 1712 feet north and 500 feet west of SEc S WSE Section 74-9s-10e.

The finding of dome formation at Bayou Blue brings the total number of geophysical prospects which have been proved to be domes to 11; emphasizing the accuracy of geophysical methods in finding and outlining salt domes. The proving of these 11 domes is the result of drilling on only 13 geophysical prospects.

The two prospects which have been drilled on but which are not yet known to be domes are Egan, Acadia Parish, and Bayou des Glaise, Iberville Parish. Incidentally, the Union Sulphur Company, drilling on property which it holds jointly with Calcasieu Oil Company and Union Sulphur Company, was reported to be preparing to test a sand showing oil at 2705-30 feet in Schwing 3 on the Bayou des Glaise prospect. The location of that test is 311 feet east and 581 feet south of the northwest corner of Section 86-8s-8e.

Besides the Bayou Blue dome, there are five other domes in South Louisiana which were discovered through geophysics and proved by drilling, but still remain unproductive; they are: Napoleonville, Assumption Parish; Thibodaux (also known as Lutcher or Chocahoula), La Fourche Parish; Black Bayou and South Calcasieu Lake,

Cameron Parish; and Cypremont Point (or Vermilion Bay), Iberia Parish.

The remaining five geophysically discovered domes have produced oil, three on a commercial basis. The commercially productive ones are Starks dome, Calcasieu Parish; Kelso Bayou (or East Hackberry), Cameron Parish; and Sorrento, Ascension Parish. There are two, Loreauville (or Fausse Pointe), Iberia Parish; and White Castle, Iberville Parish, where oil has been found but not in commercial quantity.

There are 19 geophysically outlined domes in South Louisiana which have not yet been tested by actual drilling; but at least nine of the 19 are due to be tested within the near future, inasmuch as they are the property of the Louisiana Land & Exploration Company, and that company recently made an agreement with The Texas Company, whereby the latter has obligated itself to drill at least four tests on each of the prospective domes.

Raccoon Bend Wild Gas Well Under Control

Houston.—Humble Oil & Refining Company and Valley Oil Corporation's Urban 2, the Raccoon Bend, Austin County, well which blew out about a month ago, and ran wild for nearly three weeks, making a large volume of gas together with considerable water, has been brought entirely under control, and early this week mud was being pumped through the casing into the hard sand from which the production was coming.

After eight "I" beams had been placed over the 45-foot-diameter crater, crossing each other, a steel derrick, which had been erected nearby, was skidded over the well and tied down. A wooden derrick, which was first put over the well, had been demolished. The first attempt following the placing of the steel derrick, was to run 20-inch pipe down over the 13 3-8-inch through which the gas was blowing; but only two joints could be run in in this manner, and the idea of running in about 200 feet of the 20-inch and cementing it had to be abandoned. The next plan, which proved successful, was as follows. Two Cameron Iron Works tubing control heads were placed on top of the 13 3-8-inch casing, which protruded above the top of the ground; a nipple separating the upper of the two heads from the lower.

Then 1040 feet of four-inch drill pipe was snubbed into the well through the two heads. The use of two heads was necessary in order to let the collars in the string of tubing pass down. To allow the collar to pass through the upper head the rams on the lower head were closed to the extent they barely allowed the pipe to slip between; and in the meantime the rams in the upper head were opened enough to allow the collar to pass between them. After the collar had passed below these rams in the upper head, they were closed, and those in the lower head were opened. Thus the collar passed on downward; in the meantime, the well's production being taken from the valves on the sides of the control heads, intermittently from the upper and the lower heads. This principle is being used in the Shreveport district in connection with gas production; for tubing gas wells against high pressure without killing the gas.

After 1040 feet of tubing had been run into the well, extending below the bottom of the casing, mud was pumped through the drill pipe into the formation yielding the gas. Mud was mixed at the rate of 5000 barrels per day and pumped into the well.

Further plans in connection with the well have not been determined yet. The well was drilling at 2327 feet when the gas blowout occurred. The test is located practically in the middle of the present field, between producers on the Gotosky and the Bracey lands.

Bayou Bouillon

Houston.—Rycade Oil Corporation's Bayou Bouillon 4 in the Bayou Bouillon field, St. Martin Parish, Louisiana, is back on production, swabbing around 100 barrels per day.

This well was completed over a week ago, flowing at the rate of 100 barrels per hour, but it sanded up, and quit flowing.

In addition to Bayou Bouillon 4, Rycade Oil Corporation has two other producers in this South Louisiana field: Atchafalaya 2, which is pumping around 250 barrels a day, and State 2 which is pumping 100 barrels.

Rycade Oil Corporation discovered the first pay on this dome last spring, and is the only operator there. Its activity at present is as follows: Atchafalaya Fee 3 is coring at 4011 feet in sand and shale showing oil; Atchafalaya Fee 4 is drilling sandy lime at 3788 feet; State 1, which was formerly a producer at 3080 feet, will test at 2100 feet; Bayou Bouillon 2 is rigging up; and Bayou Bouillon 5 is at a total depth of 3635 feet. State 3 and Atchafalaya Fee 5 are locations; and Bayou Bouillon 6 is a derrick.

Second Well Completed at Cedar Creek

Houston.—Cranfill & Reynolds and A. M. Loomis, who drilled the discovery well at Cedar Creek, southwestern Bastrop County, have also finished their first offset to the discovery well as a producer. This second test is the Andy Yost 2. It came in late last week flowing 250 barrels daily from the serpentine at 1529-37 feet. The discovery well, Andy Yost 1, is pumping 200 barrels per day.

Cranfill & Reynolds and A. M. Loomis are now rigging up Yost 3. Amerada Petroleum Corporation, drilling Yost 1 in the Cedar Creek field, encountered the serpentine at 1548 feet, and drilled through it to 1767 feet at which depth a test showed salt water. The well is now being plugged back to 1700 feet. Atlantic Oil Producing Company's Yost 1 was drilling early this week at 848 feet in shale. The Texas Company's Yost 1 is a derrick.

Hackberry Dome Well Flows 240 Barrels

Houston.—Duhon 2, of the Cameron Oil Company and Rycade Oil Corporation, discovery oil well of the old Hackberry dome, Cameron Parish, Louisiana, is now flowing 240 barrels of pipe line oil per day through a one-eighth inch choke.

This well came in a little over a week ago as the first producer of the dome, although numerous tests had previously been drilled at various places on the dome.

Duhon 2 is near the center of a 240-acre block of the Cameron Oil Company and Rycade Oil Corporation, being on the south edge of the dome. Some time ago the Cameron Oil Company, which had not yet been joined by Rycade Oil Corporation, abandoned Duhon 1 as a dry hole at 4000 feet; location was about one-quarter mile southeast of the present producer.

Following completion of Duhon 2, Cameron Oil Company has made location for Benson Vincent 1, which is 810 feet north and 150 feet west of SEc SW SE Section 29-12s-10w.

Rycade Oil Corporation has 120 acres about 4500 feet southwest of the Duhon 2, and 300 acres one and one-half miles northwest of it. On the 300-acre block the Rycade Oil Corporation is now drilling Gulf Land 1 (Yount-Lee 1), and was in rock at 3005 feet early this week.

Yount-Lee Oil Company, drilling on the north side of the old Hackberry dome, is below 3600 feet in its School Land 8.

Superior Pays Two Million for Lease

Big Springs, Texas.—Superior Oil Corporation, Tulsa, has acquired the one-half interest held by the F-H-E Oil Company, Sherman, Texas, in three producing 160-acre leases on the Dora Roberts ranch, Howard County, for a cash consideration of $1,000,000, and an additional $1,000,000 payable out of oil. Superior Oil Corporation obtained the other one-half interest early last month in its purchase of properties of the Moody Corporation. The properties are located in the north half of Section 136 and the northwest quarter of Section 137, and are practically proven for production, which is obtained from three separate horizons, with the largest wells in the 2900-foot, or deep lime pay. There are six shallow sand wells on production; three wells producing from the 2500-foot lime; and six deep producers, with a half dozen additional tests underway. The current production from these wells ranges from 3000 to 4000 barrels daily, and the shallow oil is being sold at 80 cents per barrel, while the crude produced from the 2500- and 2900-foot pays brings the usual West Texas posted price of 65 cents per barrel.

Sharp Decline in New Production During November

Increase in completions tempered by large number of small producers; California gain in new production feature of month

By H. J. STRUTH
Petroleum Economist

WHILE there was a sharp gain in the number of wells completed during November, the new oil production was considerably lower than in October. This was due to the fact that a great many completions proved to be small. This was particularly the case in Texas, Louisiana, Arkansas, Pennsylvania, Ohio, Kentucky and West Virginia. These states contributed a large number of new wells which, in most instances, proved to have an initial flow of less than 100 barrels. On the other hand, California showed a considerable gain in new wells, with a sharp increase in new production. Activity was at high pitch in the Long Beach area, where 36 wells were completed having an aggregate initial flow of 29,200 barrels. In the Santa Fe Springs field, only six wells were completed during the month, but the new production was boosted by 34,500 barrels. One well, with an initial of 4,500 barrels, proved to be the feature of the Kettleman Hills district, and was responsible for a considerable rush in new operations there.

Winkler County, Texas, was the scene of considerable excitement during November when 36 new oil wells were completed with a total initial of 144,715 barrels. This field was extended somewhat by the completion of a 2000 barrel wildcat by the Empire Gas & Fuel Company. The bringing in of a considerable number of very small wells in Central and West Texas, however, resulted in a decided dropping off in new production for the entire state. In October, the initial from 344 wells completed was 409,316 barrels, while, in November the initial from 335 wells was only 248,078 barrels. In contrast, the average per well during October was 1190 barrels, compared with an average of only 740 barrels during November.

All fields, with the exception of the Gulf Coast and California, showed a decline in daily average production during the month. Oklahoma, through the declines at Little River and St. Louis, registered the most marked decrease in daily average output. California's daily average production took a sharp turn upward when activity in the Santa Fe Springs, Long Beach and Ventura fields resulted in the completion of numerous large producers. Activity in Goose Creek, Hull, Pierce, South Liberty and Spindle Top, in Coastal Texas, as well as East Hackberry, Lockport and Vinton, in Coastal Louisiana, resulted in boosting the daily output of the Gulf Coast fields.

UNITED STATES PRODUCTION

Following is the gross production of crude oil in the United States during November, as compiled by the American Petroleum Institute. There is a slight difference in the totals shown below as compared with those on pages 41-42 showing the figures by individual fields; the difference being that the A. P. I. figures are in round numbers for the sake of clearness and convenience.

States—	November Daily Average	November Total Production	October Daily Average
Oklahoma	715,750	21,472,000	741,350
Kansas	96,600	2,897,350	97,900
Texas (outside Gulf Coast)	586,350	17,590,200	598,550
Gulf Coast	135,100	4,052,800	129,950
North Louisiana	38,600	1,158,100	38,800
Arkansas	83,000	2,490,050	83,550
Eastern States	109,700	3,291,500	114,000
Rocky Mountain	81,150	2,434,400	83,300
California	653,050	19,591,900	624,450
Total	2,499,300	74,978,300	2,511,850

Oklahoma

That a new flush area of sizeable proportions is necessary to hold Oklahoma's near future daily average crude output anyway near its present yield is seen in the continued sharp decline in initial production given the state's best producing fields. An example of the heavy decline is evidenced in Greater Seminole as follows: During September, 83 new wells in Seminole County had a combined initial yield of 147,390 barrels. In October, the new production amounted to only 47,682 barrels from 61 wells. In November, 36 new wells had 21,155 barrels initial output. The rapid-fire completion of big wells in South Little River pool resulted in the big initial for September, and the drilling up of this pool results in the sharp decrease in new oil in Seminole County. It has taken wells of large initial yields to hold the daily output to its level of September, October and November, and the loss of new oil is destined to result in a comparatively low daily output in the future.

St. Louis field, the star producer of Oklahoma recently is shown by statistics for the three months to be also on the decline, though not so drastically as Little River field. Initial production from St. Louis for the three months shows 65,176 barrels from 31 wells in September, 45,366 barrels from 38 wells in October, and 38,304 barrels from 46 wells in November. Here, as in Little River field, the future daily output of crude is destined to drop rapidly as the strength of the new wells is seen to be weakening as compared with the two months of strong initial producers.

Oklahoma fields combined, of which St. Louis and South Little River played the only important part, had 65,569 barrels initial production from 161 new oil wells in November, as compared with 100,786 barrels from 198 wells in October, a decline of 35 per cent. in new oil within a month. There were 26 gas wells and 92 failures completed in Oklahoma during November.

Kansas Activity

There were 91 wells completed in Kansas fields during November, including 39 oil wells, eight gas wells and 44 failures. The combined initial yield from the 39 producers was 5095 barrels, as compared with 4990 barrels in October from 19 oil wells completed. Butler County led in importance, having 12 new oil wells with a total initial output of 2090 barrels. Elk County had 10 oil wells completed for 1535 barrels. Cowley, Greenwood, Marion, Rooks, Russell and Sumner Counties shared the remainder of the new oil, but all were below 500 barrels.

California

Santa Fe Springs gave notice during the month that it is going to be a flashy performer. With eight good completions, production jumped to 50,000 barrels from the Buckbee zone. Developments during the month showed that the much-sought formation is much thinner than suspected and that bottom water may be expected in many parts of the field. One well cored gray sand after 150 feet of the Buckbee zone had been cut, while another sprung a surprise by producing a high percentage of water after more than 100 feet of sand was opened up. This latter well did not core the bottom of the formation, so sure was the company of obtaining oil and no water. Drilling so far indicates that the deep zone will not exceed 200 feet in

thickness at any point and will be much thinner near the edge of the field. Regardless of this fact, however, a very large production will be obtained, because of the large number of wells that will be completed within a very short time.

The rather rapid decline of two or three of the new producers has caused much concern, but such a drop is not unusual when it is considered that the wells are producing from a maximum of 150 feet of sand. The well that blew out and caught fire released the pressure over a wide area, the production of one well nearby having dropped from 3000 barrels to 900 barrels within three weeks.

The intermediate zone, almost an unknown formation when the rush for the Buckbee sand began, jumped into the limelight during the month with a 5000-barrel well, in addition to the first completion in the sand, which increased its production to 6000 barrels. This formation has proved to be 500 feet thick and lies between 4900 feet and 5500 feet. About 100 feet of shale separates it from the Buckbee zone below. All in all, it has made a better showing than the buckbee zone. Many wells will be tested in this formation before making a bid for the Buckbee sand. The lack of proper coring records probably kept the intermediate zone from making an even better showing. The two wells completed in the sand failed to decline, and one showed a steady gain, increasing from 2250 barrels to more than 5000 barrels within two weeks. A short survey showed the intermediate zone to hold as much promise as the main objective, the Buckbee sand.

California Curtailment

Champions of conservation fought a good battle during the month, practically forcing the operators to agree on some sort of curtailment. The re-pressuring of the upper zones was at first advanced as one way of reducing production, but it was later admitted that only the actual pinching in of wells would bring the necessary results. It now appears that conservation will be enforced in the field. The fear that the state may take a hand if gas is wasted prompted the operators to reach a tentative agreement to reduce production when it reaches a dangerous point.

The new Elwood field showed it was not a temporary flash by yielding two large producers during the month. One came in with an initial production of 4500 barrels, while a second was completed as a 4000-barrel producer. The field total reached 10,000 barrels from only three wells. Facilities for marketing the oil have been completed and the crude is being shipped as produced. Several companies entered the field during the month and large leases changed hands.

Operators who had suspended operations in the Kettleman Hills district rushed in equipment during the month for another drilling campaign. In the meantime, the discovery well continued to produce more than 4000 barrels of 60 gracity oil and 45 million cubic feet of gas. With only one well, the extent of the field remains a question, but only a few wells like the discovery producer would be needed to make a district an important factor. Pipe lines from the field to trunk lines were completed and all oil will be shipped as produced.

Long Beach struggled through the month in good shape, having failed to show a decline in spite of a poor start. Production showed an increase for two weeks but settled to a figure of 190,000 barrels.

Macpherson Contracting Company Moves to Dallas

Dallas, Texas.—Edwin Allan Macpherson, who has participated as contractor on some of the largest oil and gas line projects in Texas and Louisiana in recent years, has transferred office headquarters from Fort Worth to Dallas, and also changed the firm name to Macpherson Contracting Company. Office space has been taken on the 19th floor of the Magnolia building, and the removal of office equipment was completed late last week. W. R. Mitchell is general manager of the company.

Detailed Statistics for November
Pages 68 and 70

W. P. R. A. Plans Division of Research

Chicago, Ill.—The annual meeting of the Western Petroleum Refiners Association will be held at Saint Louis, March 12th, with convenion headquarters at Hotel Jefferson, it was announced by Howard Bennette, managing director of the Association. The one day session will be given over to the customary association business, but with work of the group concentrated on its reorganization plans and expansion of its program of influence this involves the formation of a new group, or division of member petroleum refiners operating in the north central states. Headquarters for this group will be at Chicago. Offices have been secured in the McCormick Building at 332 South Michigan Ave. The Association also plans the formation of a research division or department; the work of this section will be outlined at the spring meeting. Howard Bennette, managing director of the Association in connection with the foregoing announcement also stated that A. V. Borque who recently resigned as secretary and treasurer of the Natural Gasoline Association of America will begin his new connection as assistant to the managing director of the W. P. R. A. on December 15th. Headquarters of the Association are in the Cosden Building, Tulsa.

UNITED STATES FIELD STATISTICS

Following are the completions, showing oil wells, gas wells, failures, and initial production of crude by states for the four weeks ending November 24, as compiled by THE OIL WEEKLY:

State	Comp.	Oil Wells	Gas Wells	Failures	Initial Prod.
Arkansas	37	12	10	15	956
California	70	68	..	2	98,255
Illinois	19	8	3	8	280
Indiana	7	1	3	3	5
Kansas	91	39	8	44	5,095
Kentucky	145	99	8	38	2,732
Louisiana	77	17	11	49	6,701
Michigan	19	13	6	..	7,120
New York	55	51	1	3	186
Ohio	245	88	97	60	1,858
Oklahoma	279	161	26	92	65,569
Pennsylvania	314	267	30	17	904
Tennessee	3	3	..	..	390
Texas	633	335	41	257	248,078
West Virginia	88	16	60	12	99
Total	2,082	1,178	305	598	438,228

PAST TWELVE MONTHS

The record for the past twelve months is an interesting study for comparative purposes, the following table giving the field statistics for all States in the Union:

Month—	Completions	Producers	Gas Wells	Failures	Initial Prod.
Nov., 1927	1,651	901	205	545	367,657
December	1,857	1,020	311	256	522,536
January, 1928	1,203	640	179	384	396,150
February	1,376	729	197	450	336,319
March	1,693	884	283	526	555,613
April	1,486	772	216	498	397,825
May	1,495	770	186	539	413,378
June	1,545	896	136	513	457,662
July	1,534	882	189	463	522,969
August	1,730	974	217	539	969,742
September	1,809	1,050	223	536	976,494
October	1,729	979	237	513	566,766
November	2,082	1,178	306	598	438,228

North Louisiana-Arkansas Wildcats Hold Interest

Champagnolle area still adding producers but water is appearing in northeast extension wells; all new Arkansas wells in Union County

SHREVEPORT. — Completion of interesting wildcats in widely separated fields in North Louisiana, Arkansas and East Texas, recently has kept activity at a high pitch.

The latest wildcat to draw attention is Benedum and Trees' State 1 in Section 22-14-12, DeSoto Parish, which came in last week making 25,000,000 feet of gas and spraying approximately 100 barrels of salt water from 2633 feet. Production is coming from 10 feet of broken sand.

While the test is not officially completed, as operators may decide to kill it and go deeper, its performance is considered of importance in that it is between the old Naborton oil field in DeSoto Parish and the Elm Grove gas field in Bossier Parish. It is approximately seven miles north and slightly west of the former and 11 miles south and slightly west of Elm Grove. The well is also five miles northeast of a wildcat gasser completed last August by R. O. Roy on the Fuller lease in Section 3-13-13.

It follows the completion of Gulf Refining Company's Pickering Lumber Company 1, in the G. H. Patterson Survey of Shelby County, Texas, which, after being deepened to 3442 feet, again came in making four and a half million feet of gas and flowing 37 barrels of 38 gravity oil. It also follows the completion of R. L. Gay, Trustee's, Bowman-Hicks 2, in Section 14-7-14, Sabine Parish, which is flowing 50 barrels of 41 gravity oil from 2130 feet. Thus the DeSoto wildcat is given more than passing notice.

Another wildcat oil producer is Northwest Louisiana Gas Company's Pinewoods Lumber Company 7, in Section 33-23-11, Bossier Parish, on the southeast edge of the Spring Hill gas field, as a 35 barrel pumper at 3041 feet. This well is approximately two and a half miles northwest of a 150 barrel pumper completed by the Magnolia Petroleum Company several months ago as a 150 barrel pumper at near 2711 feet. This well was in Section 1-22-11. However the Northwest Louisiana Gas Company in Section 37-23-11 drilled 3418 feet in Pinewoods Lumber Company 8, and was abandoned this week as a salt water hole.

Due to the uncertainty of oil wells in this area the completion of the Pinewoods 7 is not regarded as of great importance. Several small producers were added on the same lease in 1923, but only one of them was consistent, salt water taking the others after brief periods of producing.

Champagnolle

Champagnolle, in Union County, Arkansas, continues to add producers although salt water is beginning to appear in some of the northeast extension wells. While no salt water holes were completed during the last week, Magna Production Company's El Dorado Realty Company 1, in Section 7-17-13 is flowing 20 barrels of salt water with 180 barrels of oil from 3091 feet.. The best well of the week and one of the best yet added in the northeast part of the field was Ohio Oil Company's C. B. Nash 3, Account 1, completed at 3020 feet for 1563 barrels of clean oil. In the discovery section Magnolia Petroleum Company deepened Carroll 4 to 3010 feet for 80 barrels on the beam. Lion Oil Refining Company's C. B. Nash 3 in Section 6-17-13, completed several days ago as a 670 barrel flowing well from 3062 feet, has increased its flow slightly and is now making 700 barrels daily.

Interest in Arkansas outside Champagnolle is now centered on the wildcat test of McDonald Brothers, Wilson 1, in Section 25-15-18, Union County, five miles due west of Louann production.

The Wilson test made four fourbles of oil and one fourble of drilling mud from 2805 to 2821 feet, then 6⅝ casing was pulled in two while being set at 2805 feet and operators are now fishing for four fourbles of drill stem. The fact that the oil show was obtained more than 800 feet below the producing horizon in Louann adds to the interest in the test.

After having acquired a tract of 5000 acres in Sabine Parish from the Long-Bell Lumber Company, R. L. Gay, Trustee, who completed Bowman-Hicks 2 in Section 14-7-14 at 2130 feet as a 50 barrel flowing well, announced that two new locations will be made immediately, one a quarter of a mile north of the producer and one about the same distance east. The wildcat producer is now flowing and is slightly increasing its production.

Besides Arkansas' three producers added during the week and the North Louisiana wildcats, the latter area also got three gas wells, including one Trinity sand test in the Cotton Valley field. This is Superior Oil Company's McCook and Hibbler 1, in Section 21-21-10, completed at 4679 feet with 329 feet of broken lime and which gauged 23,600,000 cubic feet. Arkansas Natural Gas Corporation added its Potts 1 in Section 30-19-4s, Ouachita Parish, as a 2,700,000 foot gasser at 2186 feet, and Magnolia Petroleum Company added M. L. McCoy 1, in Section 29-16-6e, at 2450 feet making 20,000,000 feet of gas.

An effort to extend the Sligo gas field in Bossier Parish two miles east ended in failure during the week when Murff 1, in Section 16-17-11 at 2516 feet. Baca Drilling Company drilled dry its State 1, in Section 16-16-10, Bienville Parish, and it was abandoned at 2561 feet.

In East Texas, Natural Gas Products Company completed Tom Moore 2, in Jordan Survey, at 2695 feet as a 6,000,000 foot gas well.

New drilling activity continued approximately even during the last two weeks, 12 new locations having been announced during the last week as compared to 15 the week before. The week's new tests are evenly divided between North Louisiana and Arkansas, each state having six.

All of the new Arkansas wells are in Union County, with five being in Champagnolle. J. W. Hooser has made location for Slade 4, in sw se Section 3-17-14 on a location formerly made by Marr and Hooser. H. L. Hunt will drill Gregory 6, in ne nw Section 15-17-14, where derrick is already up. Magna Production will go east of production in the northeast part of Champagnolle to drill El Dorado Realty Company 2, in nw sw Section 8-17-13. The derrick is already up. Pure Oil Company has made location for W. E. Gregory Estate 6, in nw nw ne Section 15-17-14. Rovenger Oil Corporation has also made location for W. H. Perdue B-1, se of ne of Section 9-17-14. Sam Sklar, Trustee, is drilling at 200 feet in Fitzgerald 10, in the southwest corner of Section 8-18-15 on the Gladys-Belle lease.

In North Louisiana, Thomas and Fitzsimmons have a derrick up for Muslow 7, in Section 31-21-15, Caddo Parish, Pine Island district. In the Cotton Valley district of Webster Parish the Cotton Valley Corporation is rigging up Hope 19, in Section 24-21-10, on the lease where 18 wells were drilled by the Crusader Oil and Producing Company. In the Naborton field of DeSoto Parish Louisiana Public Utilities has spudded Rambin 1 in Section 13-12-12. In Ouachita Parish Southern Carbon Company has made location for Fairbanks 10, in Section 43-20-4e, and in 6-19-5e of the same parish United Carbon Company has made location for Fee 3. In Richland Parish Magnolia Petroleum Company has made location for D. R. Sartor 1, in Section 21-16-6e.

Executives Plan Production Curtailment by Districts

CHICAGO.—As a result of an informal discussion of the crude oil situation, attended by officials representing probably as much as 75 per cent. of the oil production of the United States, it is probable that a special committee will be appointed by the American Petroleum Institute to pursue the subjects brought up at the meeting.

Action on the invitation of W. S. Farish, president of the Humble Oil & Refining Company; W. G. Skelly, president of the Skelly Oil Company, and W. C. Franklin, of the Tidal Oil Company, executives of approximately 20 large oil companies met at dinner at the Stevens Hotel Wednesday evening, December 5. Mr. Farish acted as chairman at the informal meeting which followed the dinner and a discussion of the over-production problem was had.

The group was unanimous in expressing the belief that conservation of petroleum and efficiency of operation could best be brought about by handling the over-production problems by districts.

"The best interests of the country as a whole and of the oil industry itself can best be brought about by the orderly development of oil properties and can be best accomplished by handling the matter by districts," declared one executive, in discussing the meeting. "This was the unanimous belief of all present and it is probable that a special committee will be appointed to develop the situation brought about at the dinner."

IT is the hope of THE OIL WEEKLY that something tangible will develop of the informal dinner held by officials of oil companies at Chicago last week, which was attended by men representing probably three-fourths of the total oil production in the United States.

In the past it has appeared to many that the American Petroleum Institute was more concerned about the standardization of threads and shafts than it was about tackling the important problems affecting the industry as a whole.

It probably would be unfair to intimate that the Institute has sidestepped some of these problems, but it is not unfair to say that it has been willing to ask that governmental bodies do, through legislation, that which its own leaders either were unwilling or unable to do themselves.

For the leaders of the Industry to decide that they, themselves are capable of handling the situation through the exercise of their own brain power and the legitimate rights given them as law abiding American business men, will cause many engaged in the oil industry to feel a confidence in leadership which may have been lacking before.

We hope that we do not expect too much of the movement. But the mere fact that the leaders realize that they are facing a problem that they can work out, and that *they are working on it*, means a lot.

Meeting at Chicago Next December

Chicago.—The next annual meeting of the American Petroleum Institute has been called for Chicago on December 3, 4 and 5, 1929. This action was taken by the Executive Committee just before the close of the ninth annual meeting here last week. It was the unanimous opinion of both the directors and the executive committee that Chicago and the Stevens hotel offered the best facilities for handling the affair.

While lacking in some of the more spectacular developments that had been anticipated in view of the report of the Federal Oil Conservation Board's Committee of Nine and widespread rumors of "outside" leadership, the meeting that closed here last Thursday was far from a cut and dried affair.

The action of the Board of Directors in authorizing the executive committee to consider the feasibility of creating three major divisions within the Institute to represent the three principle branches of the industry is looked upon as a move to considerably widen the scope of the organization and thus bring all the activities of the entire industry under one general association. This would do much to further establish the spirit of cooperation which is now generally admitted as the only hope for rationalization of the industry.

Standardization Nears Completion

The work of the Standardization Division in bringing about standards in the operating equipment of the industry and thus simplifying practices as well as effecting tremendous savings to the industry, approached a point of practical completion at the meeting this year. A few changes were made in specifications where field practice has proven necessary and additional work is going forward on the various Codes of Field Practice which will be continued by committees during the year. However, it was decided to eliminate the semi-annual meeting of the division which has been held for several years at the Broadmoor Hotel, Colorado Springs.

Resolutions were drawn and presented at the general sessions of the institute commending the work of the Bureau of Mines in the gathering and dissemination of statistics to the Petroleum Industry and praising the work of the International Petroleum Exposition and pledged the support of the Institute to these two bodies.

Shreveport, La.—Effective January 1 use of air compressors or machines in the production of oil from a depth of 3100 feet in the Champagnolle area in Township 17, Ranges 13 and 14 will be prohibited, according to a decision of the state conservation commission in a special session. The rule affects the entire producing Champagnolle field where approximately 55 wells are producing oil.

Institute Division Will Seek Data On Field Problems

Mid-year meeting of the Division of Development and Production Engineering called at Tulsa in May

WHILE just completing its first year as a unit in the American Petroleum Institute, the meeting of the Division of Development and Production Engineering at Chicago last week filled an important place in the program of the annual gathering of the Institute. Much of the valuable information to come from the meeting was presented in the form of papers or technical discussions at the various group sessions of this division.

It was the desire of the Board of Directors that no change be made in the organization or personnel of the Division at this time and with a broader scope of work undertaken for the coming year it is expected that the new branch will definitely establish itself as the practical and engineering organization of the industry.

A meeting of the Division of Development and Production Engineering will be called at Tulsa some time in May. This will serve as the mid-year gathering of the unit since the regular semi-annual meeting of the Standardization Division at Colorado Springs has been abolished. Last June the Division held a joint session with the Standardization groups at Colorado Springs.

In case the action taken by the Board of Directors of the Institute, authorizing the Executive Committee to consider the feasibility of organizing the Institute into three Major Divisions, representing the three principle branches of the industry, is reported upon favorably, the Division of Development and Production Engineering will become a part of the General Division on Production. Some changes would likely be made at that time in the organization.

However, proceeding under its previous method of operation, the Division will attempt during the coming year to coordinate its activities so as to make available to the industry as much data as possible on the more important problems of the operating branch. This will be accomplished through the cooperation of the five regional divisions in the preparation of the divisional meeting programs.

It was suggested by the two committees of Drilling and Production Practices that a set number of subjects be accepted by all divisions, one of which would be included in each regional division meeting, thus giving a general contribution to each subject. This would result in a more or less complete handling of these more important problems sometime during the year and would make possible the presentation of a complete paper on the subject at the next annual meeting of the Division.

This suggestion was acted on favorably by the General Committee which also heartily endorsed the suggestion of the Texas-Louisiana Division of establishing local chapters of the organization throughout the various districts. These local chapters could meet as often as possible and would serve as round-tables for the preparation of papers to be presented later at the regular Divisional meets.

It was also agreed that each of the five regional divisions will hold two meetings a year, one between each of the two general gatherings of the entire Division.

Programs Arranged

At a preliminary meeting of the Committee on Production Practices with C. E. Beecher, chairman of the Committee, presiding, a number of subjects which will be developed during the coming year were considered and six important problems were presented to the General Committee as a program for this committee. The six subjects are as follows in line of importance as designated by the committee:

1. Maintaing Pressure and Repressuring during early stages of development.
2. Gas lift.
3. Flowing wells.
4. Repressuring partly depleted fields.
5. Pumping.
6. Water problems.

A program of subjects were also decided upon by the Committee on Drilling Practices and passed by the General Committee but this information has not been released by the organization. It is thought, however, that the more important subjects to be considered by this committee during the year will include: deviation of drilled holes, casing practices, cementing and shutting-off practices, mudding practices, gas wells, drilling prime mover equipment and rigs and derricks.

All group sessions at the Chicago meeting were well attended by representative engineers and field men from all parts of the country. Considerable discussion was had on the several prepared papers and much interest was shown in the proposed programs for the local meetings of the various regional divisions.

K. R. KINGSBURY
Standard Oil Company of California, Elected Vice-President of Production, American Petroleum Institute

The New President of the American Petroleum Institute

EDWIN B. REESER

WHEN the Greater Seminole pools of Oklahoma first began to cause consternation in petroleum circles, the first man to venture into what has come to be the present conservation program was Edwin B. Reeser, president of the Barnsdall Corporation. He called the first meeting of Seminole producers. The Seminole shutdown committee resulted.

Handling excess oil at Seminole went through many ramifications. Finally, however, it was stamped with success with the naming of an umpire to control the situation. Mr. Reeser served as chairman of the committee throughout its work.

The man but recently elected president of the American Petroleum Institute has served for 38 years in different activities of the oil industry. It was August 20, 1891, that he began working for the Oil City Fuel Supply Company at Oil City, Pennsylvania.

Conditions then in comparison with conditions today reveal something of the changes that have come to the petroleum industry. The daily output of the oil fields of the United States was then less than 100,000 barrels. Oil was selling at 50 cents a barrel. It was a common opinion in petroleum circles that oil would never be found west and south of the Little Kanawaba River. The Little Kanawaba flows into the Ohio River at Parkersburg, West Virginia.

Later Mr. Reeser entered into a partnership with Theodore N. Barnsdall at Sisterville, West Virginia. Theodore N. Barnsdall was the son of William Barnsdall, driller of the second American producing oil well and builder of the first refinery. He continued with this relationship until the death of Mr. Barnsdall in 1918 made it necessary to form an organization to conduct the business.

The Barnsdall Corporation was then formed and Mr. Reeser became president. Shortly thereafter he moved to Tulsa, where headquarters of the concern have been maintained since. It was in 1926 that the Barnsdall Corporation bought the Waite Phillips Company, a deal that involved $26,000,000.

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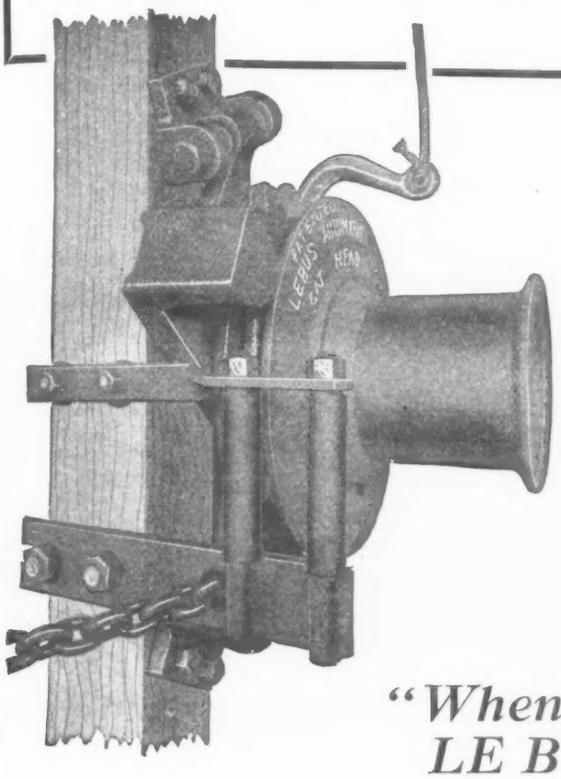

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Say you saw it in The OIL WEEKLY

Action of Deep Well Pumps

By F. W. LAKE
Union Oil Company of California

WITH the advent of more severe pumping conditions due to the increasing depth of wells, more study is being given to the stresses and strains in sucker rods and the action of pumps under the various modes of operation. Higher pump efficiencies both mechanical and volumetric, together with less rod fatigue, are requisite for economic results. In determining the actual characteristics of the pumping cycle, and analysis of the relation existing between force and motion is involved.

THE PUMPING CYCLE

For a given set of pumping conditions two factors are obtainable by observation, namely, the motion of the polished rod with respect to a fixed point and the load changes occurring during such motion. The third important factor, the motion of the plunger with respect to the working barrel, must be derived by analysis from the other two.

An increased load on the polished rod is the result of a similar load increase on the traveling valve of the plunger and is concurrent with a stretch in the rods. The load increase on the traveling valve is coincident with a corresponding load decrease on the standing valve of the working barrel and is accompanied by a contraction of the tubing. By similar reasoning the reverse is true. A decreased load on the polished rod is the result of a similar load decrease on the traveling valve of the plunger and is concurrent with a contraction in the rods. The load decrease on the traveling valve is coincident with a corresponding load increase on the standing valve of the working barrel and is accompanied by a stretch of the tubing.

Within the elastic limit, the relation between load and deformation may be expressed as follows:

$$\text{Deformation} = \frac{\text{Load X Original Length}}{\text{Modulus of Elasticity X Cross Sectional Area}} \quad (1)$$

Let—

E = the modulus of elasticity and taken as 30,000,000 pounds per square inch.
D = the depth of the pump in feet.
A_r = the cross sectional area of the sucker rod in square inches.
A_t = the cross sectional area of the tubing in square inches.
dL_r = the polished rod load increment, positive if increasing, negative if decreasing, in thousands of pounds.
dL_t = the tubing load increment, positive if increasing, negative if decreasing, in thousands of pounds.
dS_r = the increment of sucker rod deformation, positive if lengthening, negative if shortening, in inches.
dS_t = the increment of tubing deformation, positive if lengthening, negative if shortening, in inches.
K_r = a constant for the sucker rod depending on E, D, and A_r.
K_t = a constant for the tubing depending on E, D, and A_t.
RF = the distance in inches of a point R on the polished rod from a fixed point F, so that during the upstroke RF increases and during the downstroke decreases and is a positive value.
dRF = the increment RF, positive during the upstroke and negative during the downstroke.
PR = the distance in inches between the point R on the polished rod and a point P on the plunger or traveling valve of the pump and representing the movement of the plunger with respect to the polished rod.
dPR = the increment of PR, positive when P approaches R and negative when P moves away from R.
PF = the distance in inches of the point P from a fixed point F.
dPF = the increment of PF, positive when P moves upwardly and negative when P moves downwardly.
BF = the distance in inches of a point B on the working barrel or standing valve from a fixed point F.
dBF = the increment of BF, positive when B moves upwardly and negative when B moves downwardly.
PB = the distance in inches between the point P and the point B and representing the movement of the plunger with respect to the working barrel.
dPB = the increment of PB, positive when upwardly and negative when downwardly.

$$dS_r = \frac{1000\, dL_r \times 12\, D}{E \times A_r} \quad (2) \text{ By definition}$$

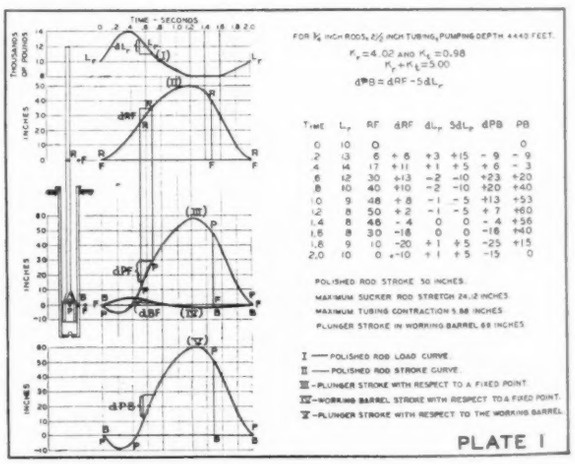
$$dS_t = \frac{100\, dL_t \times 12\, D}{E \times A_t} \quad (3) \text{ By definition}$$

$$K_r = \frac{1000 \times 12\, D}{E \times A_r} = 0.0004 \frac{D}{A_r} \quad (4) \text{ By definition}$$

$$K_t = \frac{1000 \times 12\, D}{E \times A_t} = 0.0004 \frac{D}{A_t} \quad (5) \text{ By definition}$$

$dS_r = K_r \times dL_r$ (6) From (2) & (4)
$dS_t = K_t \times dL_t$ (7) From (3) & (5)
$dL_t = -dL_r$ (8) By analysis
$dS_t = -K_t \times dL_r$ (9) From (7) & (8)
$dPR = -dS_r$ (10 By definition
$dBF = -dS_t$ (11) By definition
$dPF = dRF + dPR$ (12) By analysis
$dPB = dPF - dBF$ (13) By analysis
$dPB = dRF + dPR - dBF$ (14) From (12) & (13)
$dPB = dRF - dS_r + dS_t$ (15) From (10), (11) & (14)
$dPB = dRF - (K_r \times dL_r) - (K_t \times dL_r)$ (16) From (6), (9) & (15.)
$dPB = dRF - dL_r\,(K_r + K_t)$ (17) From (16)
$K_r + K_t = 0.0004\, D \left(\frac{1}{A_r} + \frac{1}{A_t}\right)$ (18) From (4) & (5)

Thus the plunger increment of movement with respect to the working barrel is equal to the polished rod increment of movement, less the product of the polished rod load increment and a


TIME - SECONDS
THOUSANDS OF POUNDS
INCHES
FOR ¾ INCH RODS, 2½ INCH TUBING, PUMPING DEPTH 4440 FEET.
K_r=4.02 AND K_t=0.98
K_r+K_t=5.00
$dPB = dRF - 5dL_r$
Time L_r RF dRF dL_r $5dL_r$ dPB PB
0 10 0 0
.2 13 6 +6 +3 +15 -9 -9
.4 14 17 +11 +1 +5 +6 -3
.6 12 30 +13 -2 -10 +23 +20
.8 10 40 +10 -2 -10 +20 +40
1.0 9 48 +8 -1 -5 +13 +53
1.2 8 50 +2 -1 -5 +7 +60
1.4 8 46 -4 0 0 -4 +56
1.6 8 30 -16 0 0 -16 +40
1.8 9 10 -20 +1 +5 -25 +15
2.0 10 0 +10 +1 +5 -15 0
POLISHED ROD STROKE 50 INCHES.
MAXIMUM SUCKER ROD STRETCH 24.12 INCHES
MAXIMUM TUBING CONTRACTION 5.88 INCHES
PLUNGER STROKE IN WORKING BARREL 68 INCHES.
I — POLISHED ROD LOAD CURVE.
II — POLISHED ROD STROKE CURVE.
III — PLUNGER STROKE WITH RESPECT TO A FIXED POINT.
IV — WORKING BARREL STROKE WITH RESPECT TO A FIXED POINT.
V — PLUNGER STROKE WITH RESPECT TO THE WORKING BARREL.
PLATE I

Abstract

TO determine deep well pump efficiencies requires an analysis of the relations between force and motion during the pumping cycle. Taking into account rod and tubing stretch, it is shown that the increment of plunger movement with respect to the working barrel is equal to the increment of polished rod movement less the product of the increment of polished rod load and a constant depending on the pumping depth and the rods and tubing size.

An electric dynamotograph was constructed to measure and record polished rod load and movement and to automatically compute and record the plunger movement with respect to the working barrel. With this instrument a series of tests were run on one well using the same equipment but operated under a variety of conditions. These tests are illustrated and discussed and summary curves compiled which indicate:

(1) Volumetric efficiency and plunger velocity are so related that there is one velocity which gives a maximum volumetric efficiency.

(2) Daily production and plunger stroke elongation are closely related and are dependent on plunger velocity.

(3) Mechanical efficiency is uniformly higher than volumetric efficiency.

(4) Horsepower input at the polished rod increases more rapidly than daily production.

(5) Similar investigations on equipment and operations will result in more economic pumping practice.

constant which depends on the rod diameter, the tubing diameter, and the depth of the pump.

Plate 1 illustrates the various phases of a complete pumping cycle taken from an actual set of conditions. The effect of the various factors entering into the plunger motion with respect to the working barrel are analyzed and illustrated.

THE DYNAMOTOGRAPH

In order to measure concurrently the polished rod stroke, the polished rod load, and to automatically calculate the plunger movement with respect to the working barrel, an electric dynamotograph was designed and constructed. The wiring diagram of the dynamotograph and its application to a well are illustrated in Plate 2.

The load on the polished rod is measured and recorded by means of a telemeter (developed by the United States Bureau of Standards) clamped on a calibrated rod which supports one-half of the load. The telemeter is composed of two carbon piles so arranged that as the calibrated rod is stretched with an increasing load, compression is increased on one pile and decreased on the other. In Plate 3 a simplified diagram of the telemeter circuit is shown. A predetermined current is passed through the telemeter by means of a 12-volt storage battery, the variable resistance c, and the ammeter 4. By means of the variable resistance b, the bridge circuit is balanced and the current passing through ammeter 2 is zero. When the calibrated rod stretches with a load increase, one resistance in the telemeter is increased while the other is decreased and a current is caused to flow through ammeter 2 which is proportional to the load on the calibrated rod. Thus ammeter 2 is adapted to read the polished rod load during the pumping cycle.

The polished rod stroke is measured by means of a vertical resistance wire, supported on the derrick floor, upon which a contact slides which is attached to the polished rod. By means of a battery and variable resistance a, an electric current is passed through the resistance wire. The voltage drop is measured by ammeter 1 and is proportional to the distance of the sliding contact from the bottom of the stroke. Thus ammeter 1 is calibrated to read the polished rod stroke during the pumping cycle.

The plunger stroke with respect to the working barrel is equal to the polished rod stroke less the polished rod load multiplied by a canstant which depends on the sucker rod diameter, the tubing size, and the pumping depth. Thus to calculate and read the plunger stroke with respect to the working barrel, a double wound ammeter 3 is used. One winding is connected in series with ammeter 1 so that the needle movement is of the same magnitude and direction. The other winding is connected in series with ammeter 2 so that the needle movement is opposite in direction with that of ammeter 2 and so connected by means of a variable shunt d that the magnitude of movement can be increased over that of ammeter 2 by a predetermined amount. Thus with the telemeter circuit disconnected, ammeter 3 will read the same as ammeter 1. And with the polished rod stroke circuit disconnected, ammeter 3 will read in the opposite direction from ammeter 2 and with a magnitude in proportion to the variable shunt d. With both the telemeter circuit and the polished rod stroke circuit connected with ammeter 3, it will automatically subtract from the polished rod stroke reading, the polished rod load reading multiplied by a constant, and give the plunger a stroke with respect to the working barrel.

Referring again to Plate 2, the needle movements of ammeters 1, 2 and 3 extend between the contacts of motor controls 1, 2 and 3 and so operate motors 1, 2 and 3, which in turn operate the three chart markers. The chart paper is driven at a uniform velocity by means of a governor controlled motor. Curve 1 then gives the relative position of the polished rod, Curve 2 the polished rod load, and Curve 3 the plunger stroke with respect to the working barrel concurrently throughout the successive time intervals of the pumping cycle.

A general view of the dynamotograph installed at a well is shown on Plate 4. The details of the telemeter attachment and the vertical resistance and slide are illustrated on Plate 5. Plate 6 is a view of the instrument box containing the ammeters, controls, resistances, motors and chart.

EXPERIMENTAL DATA

To investigate the relation between the various operating con-

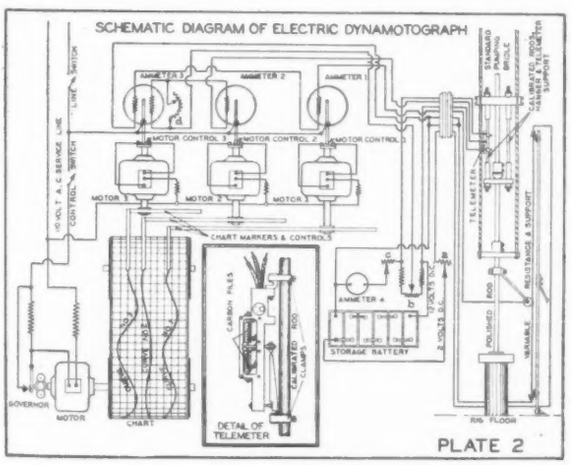


PLATE 2

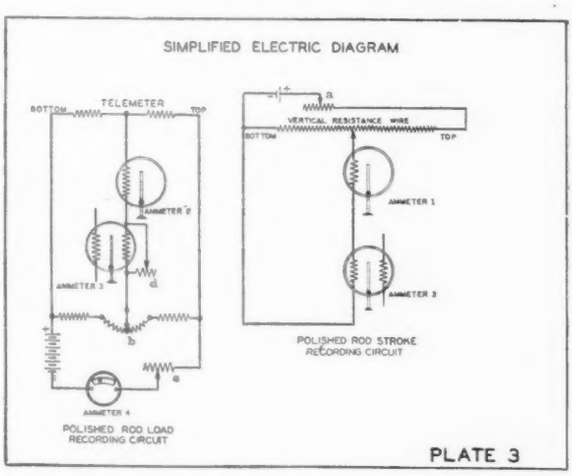


PLATE 3

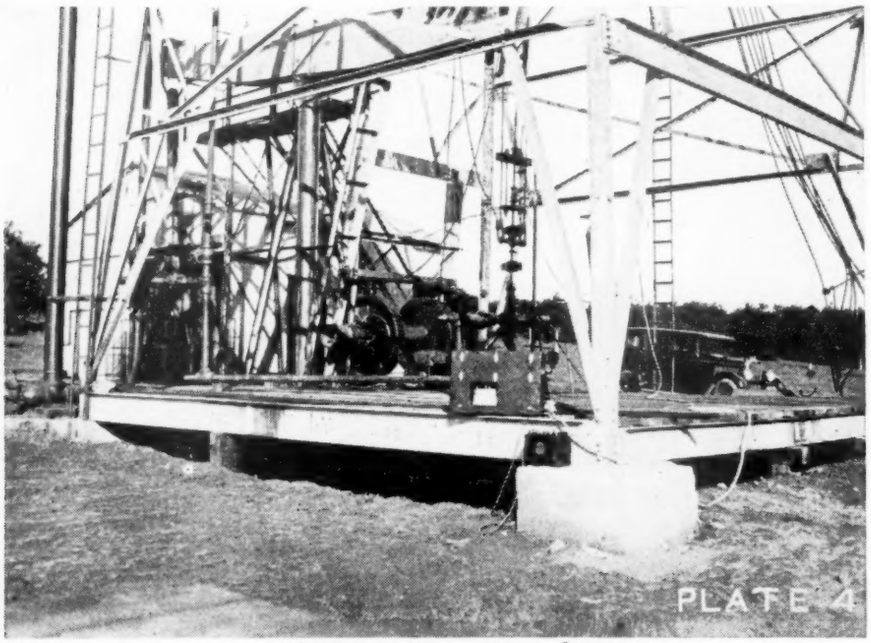
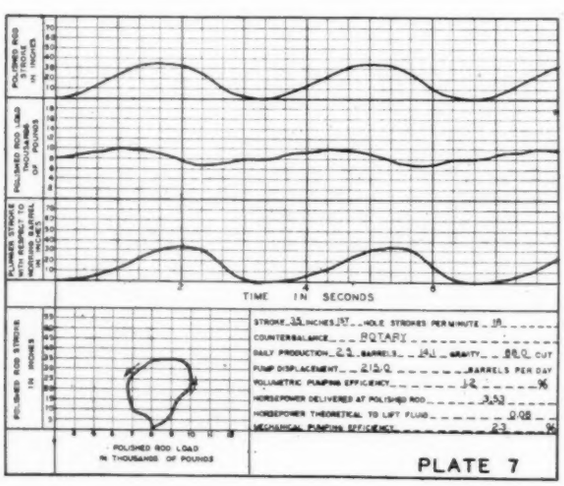


PLATE 4
General set up of the Electric Dynamotograph.

ditions and the action of the pump in the well, a series of tests were made with the dynamotograph at one well. The well was pumping at a depth of 4440 feet with ¾-inch rods and 2½-inch 6.4 pound plain tubing. A 2½-inch fluid packed type pump was used. The well was pumped by a 45-horsepower gas engine connected through a double reduction spur gear with the pitman. The usual wooden walking beam, horsehead, and polished rod connections were employed. Combined with the crank of the double reduction unit was a rotary type counterbalance. In addition, the pitman was so constructed that additional weights could be attached and thus increase the counterbalancing effect of the rotary counterbalance. In each of the first, second, and third holes of the crank, runs were made at three different speeds, both with the rotary counterbalance alone and also with 7000 pounds of cast iron weights added to the pitman. Thus 18 complete tests were made which included the effect of insufficient and excessive counterbalancing, the effect of the polished rod stroke length varying from 35 to 55 inches and the effect of pumping speeds varying from 15 to 25 strokes per minute.

In making each test, the stroke, speed, and counterbalance were regulated and the well pumped for eight hours in order to permit the pumping fluid level and other well conditions to normalize. During the ensuing four hours, hourly production gauges were taken and a chart made with the dynamotograph during each hourly period. Each chart was taken with a run of 30 seconds duration. Thus each test included from 30 to 50 complete pumping cycles uniformly taken over a four-hour interval during which the production was accurately gauged by hourly periods. By permitting eight hours for well conditions to normalize, the succeeding four hourly production gauges were noted to be extremely uniform, indicating that in each case well fluid conditions were in equilibrium.

Plates 7 to 24 show the curves and data resulting from the 18 tests. The upper curve (1) represents the polished rod stroke in inches, the middle curve (2) the polished rod load in thousands of pounds, and the lower curve (3) the plunger stroke with respect to the working barrel in inches, the three curves being taken at concurrent time intervals. The hosepower input at the polished rod is given by the curve resulting from plotting the polished rod load in relation to the polished rod stroke and is illustrated in the lower section of each plate. The conditions under which the test was made and the daily production are noted. The pump displacement is caluculated from Curve 3 and the volumetric efficency is obtained by comparing this figure with the actual production. The theoretical horsepower required to lift the fluid is computed from the pro-


POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 35 INCHES
COUNTERBALANCE ROTARY
DAILY PRODUCTION 23 BARRELS 24 GRAVITY 38.0 CUT
PUMP DISPLACEMENT 21.0 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 92 %
HORSEPOWER DELIVERED AT POLISHED ROD 3.50
HORSEPOWER THEORETICAL TO LIFT FLUID .908
MECHANICAL PUMPING EFFICIENCY 23 %
PLATE 7

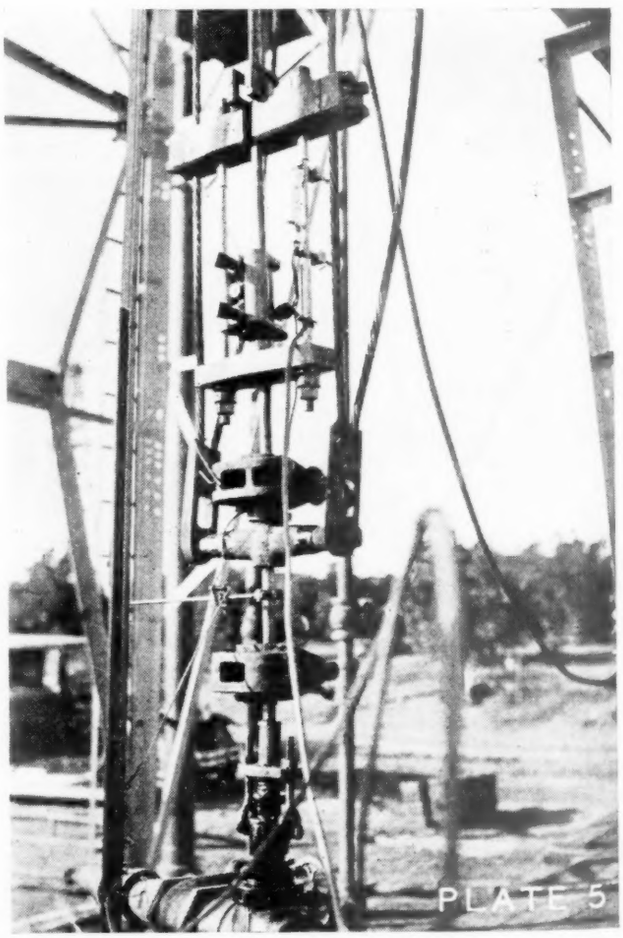


PLATE 5
Details of telemeter attachment, vertical resistance, and slide.

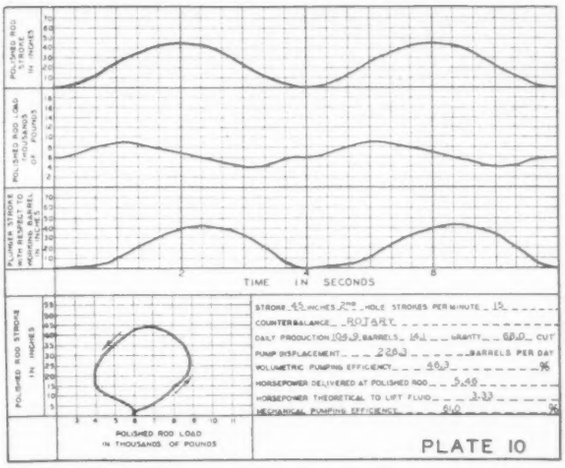

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 45 INCHES 2ND HOLE STROKES PER MINUTE 19
COUNTERBALANCE ROTARY
DAILY PRODUCTION 109.9 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 228.3 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 48.3 %
HORSEPOWER DELIVERED AT POLISHED ROD 5.48
HORSEPOWER THEORETICAL TO LIFT FLUID 3.33
MECHANICAL PUMPING EFFICIENCY 61.0 %

PLATE 10

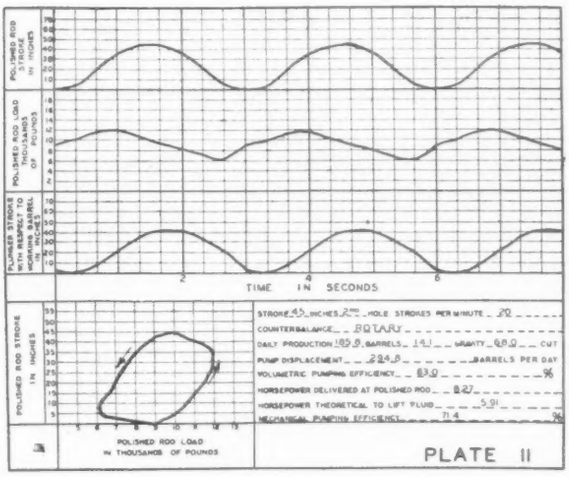

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 45 INCHES 2ND HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY
DAILY PRODUCTION 189.9 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 224.8 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 83.0 %
HORSEPOWER DELIVERED AT POLISHED ROD 8.27
HORSEPOWER THEORETICAL TO LIFT FLUID 5.91
MECHANICAL PUMPING EFFICIENCY 71.4 %

PLATE 11

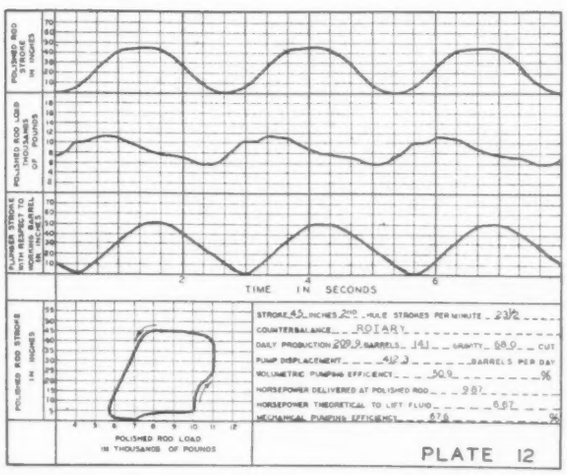

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 45 INCHES 2ND HOLE STROKES PER MINUTE 23½
COUNTERBALANCE ROTARY
DAILY PRODUCTION 209.9 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 412.3 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 50.9 %
HORSEPOWER DELIVERED AT POLISHED ROD 9.87
HORSEPOWER THEORETICAL TO LIFT FLUID 6.97
MECHANICAL PUMPING EFFICIENCY 67.8 %

PLATE 12

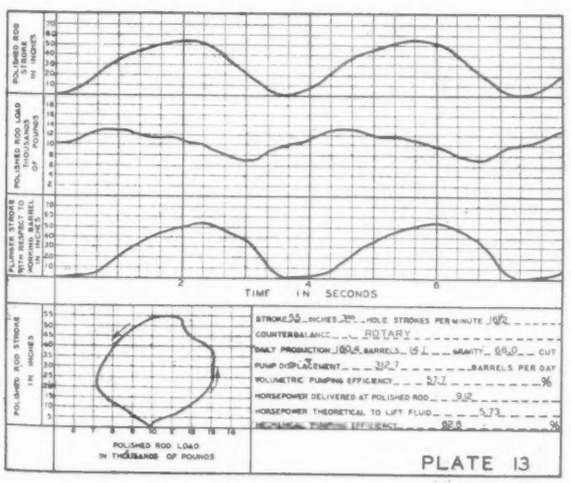

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 50 INCHES 3RD HOLE STROKES PER MINUTE 16½
COUNTERBALANCE ROTARY
DAILY PRODUCTION 180.6 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 312.7 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 57.7 %
HORSEPOWER DELIVERED AT POLISHED ROD 9.12
HORSEPOWER THEORETICAL TO LIFT FLUID 5.72
MECHANICAL PUMPING EFFICIENCY 62.8 %

PLATE 13

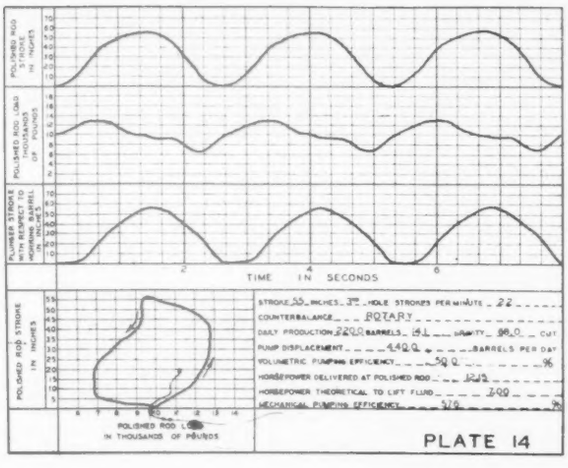

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 50 INCHES 3RD HOLE STROKES PER MINUTE 22
COUNTERBALANCE ROTARY
DAILY PRODUCTION 220.0 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 442.0 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 50.0 %
HORSEPOWER DELIVERED AT POLISHED ROD 12.12
HORSEPOWER THEORETICAL TO LIFT FLUID 7.00
MECHANICAL PUMPING EFFICIENCY 57.8 %

PLATE 14

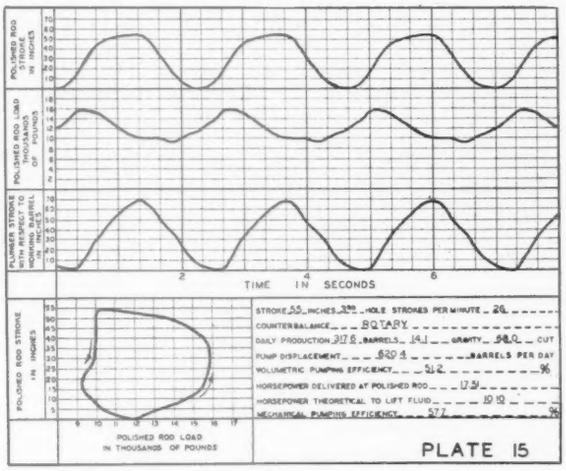

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 55 INCHES 2ND HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY
DAILY PRODUCTION 317.6 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 629.4 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 51.2 %
HORSEPOWER DELIVERED AT POLISHED ROD 17.91
HORSEPOWER THEORETICAL TO LIFT FLUID 10.12
MECHANICAL PUMPING EFFICIENCY 57.7 %

PLATE 15

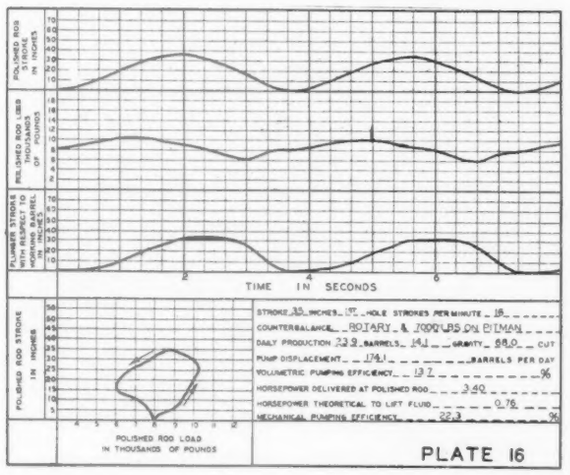

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 35 INCHES 13T HOLE STROKES PER MINUTE 18
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 239 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 174.1 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 13.7 %
HORSEPOWER DELIVERED AT POLISHED ROD 3.40
HORSEPOWER THEORETICAL TO LIFT FLUID 0.76
MECHANICAL PUMPING EFFICIENCY 22.3 %

PLATE 16

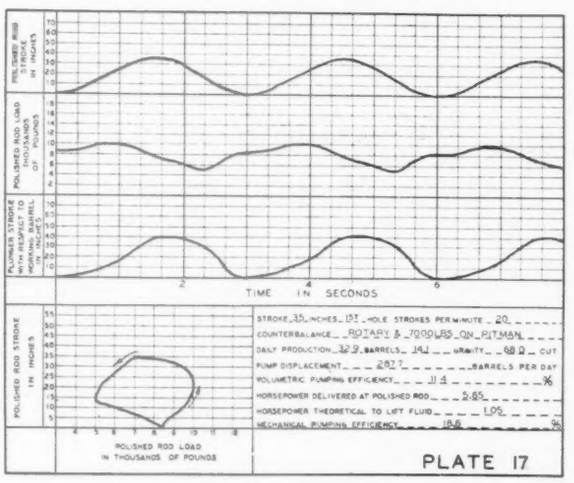

POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
PLUNGER STROKE WITH RESPECT TO WORKING BARREL IN INCHES
TIME IN SECONDS
POLISHED ROD STROKE IN INCHES
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 35 INCHES 13T HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 329 BARRELS 14.1 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 287.7 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 11.4 %
HORSEPOWER DELIVERED AT POLISHED ROD 2.85
HORSEPOWER THEORETICAL TO LIFT FLUID 1.09
MECHANICAL PUMPING EFFICIENCY 38.6 %

PLATE 17

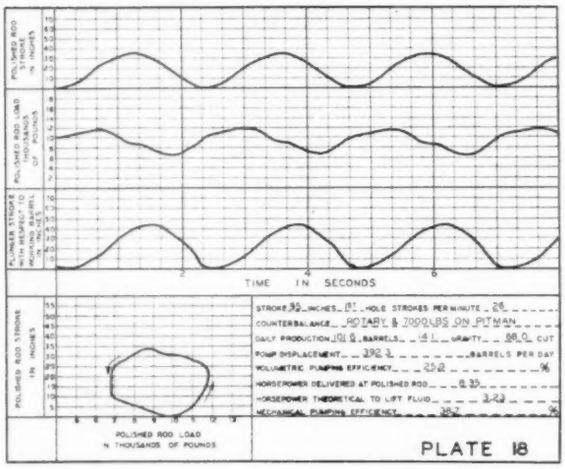

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 36 INCHES 8.1 HOLE STROKES PER MINUTE 28
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 101.2 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 392.3 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 25.2 %
HORSEPOWER DELIVERED AT POLISHED ROD 0.35
HORSEPOWER THEORETICAL TO LIFT FLUID 3.23
MECHANICAL PUMPING EFFICIENCY 39.2 %

PLATE 18

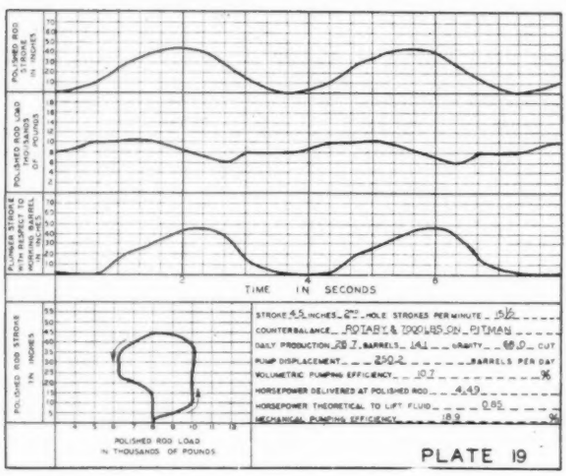

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 43 INCHES 2.0 HOLE STROKES PER MINUTE 15.6
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 28.7 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 392.2 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 10.7 %
HORSEPOWER DELIVERED AT POLISHED ROD 4.49
HORSEPOWER THEORETICAL TO LIFT FLUID 0.85
MECHANICAL PUMPING EFFICIENCY 18.9 %

PLATE 19

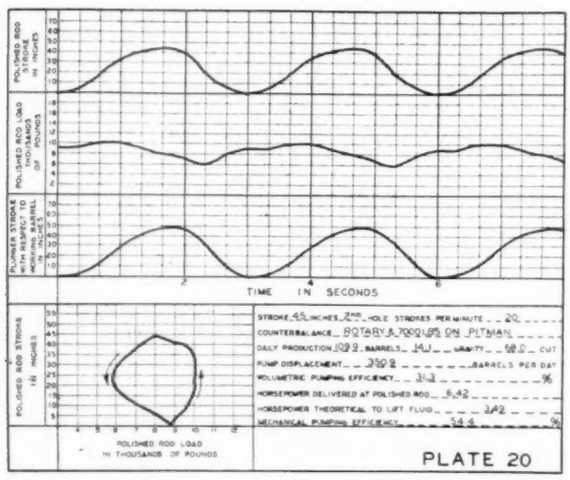

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 43 INCHES 2.0 HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 109.2 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 392.2 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 27.8 %
HORSEPOWER DELIVERED AT POLISHED ROD 5.42
HORSEPOWER THEORETICAL TO LIFT FLUID 3.82
MECHANICAL PUMPING EFFICIENCY 34.4 %

PLATE 20

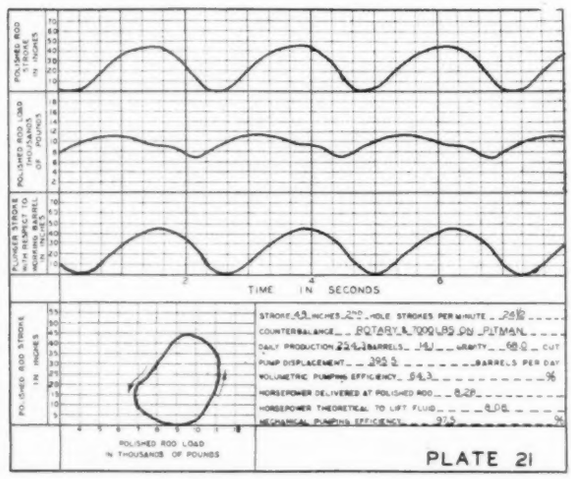

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 43 INCHES 2.0 HOLE STROKES PER MINUTE 24.6
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 224.2 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 392.2 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 54.3 %
HORSEPOWER DELIVERED AT POLISHED ROD 8.28
HORSEPOWER THEORETICAL TO LIFT FLUID 4.06
MECHANICAL PUMPING EFFICIENCY 37.5 %

PLATE 21

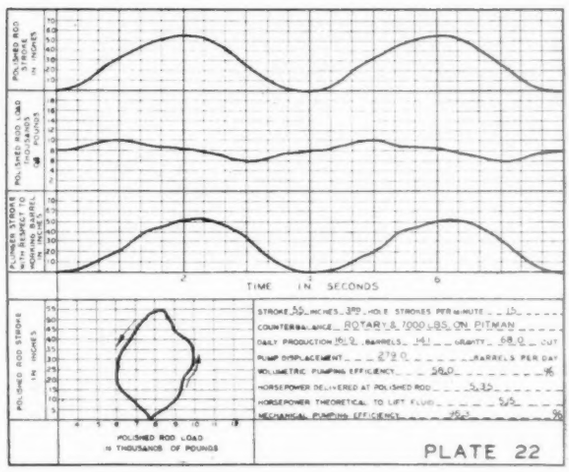

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 36 INCHES 8.1 HOLE STROKES PER MINUTE 17
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 101.2 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 279.0 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 36.0 %
HORSEPOWER DELIVERED AT POLISHED ROD 5.35
HORSEPOWER THEORETICAL TO LIFT FLUID 2.45
MECHANICAL PUMPING EFFICIENCY 45.8 %

PLATE 22

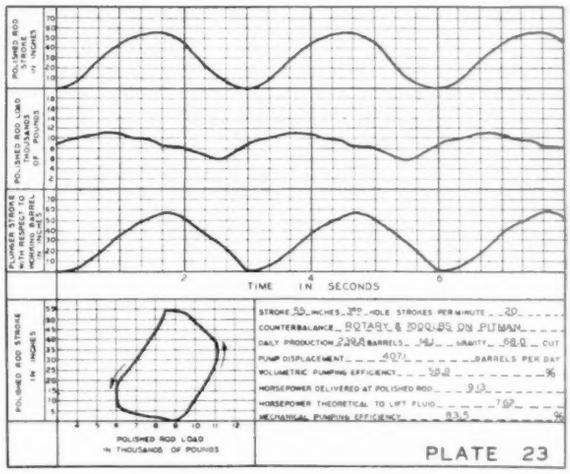

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 50 INCHES 3.0 HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 229.8 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 407.1 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 56.8 %
HORSEPOWER DELIVERED AT POLISHED ROD 9.13
HORSEPOWER THEORETICAL TO LIFT FLUID 7.62
MECHANICAL PUMPING EFFICIENCY 83.5 %

PLATE 23

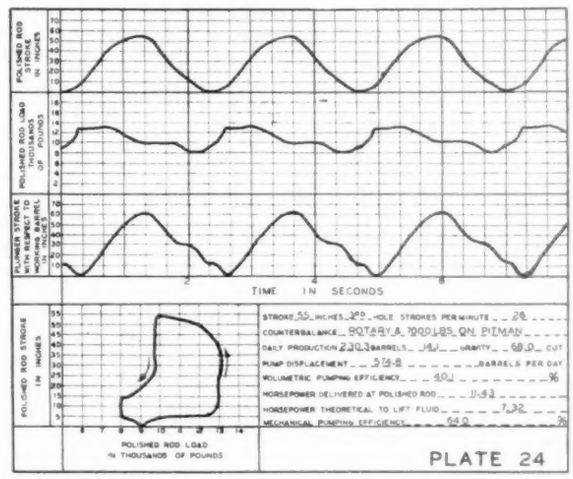

TIME IN SECONDS
POLISHED ROD LOAD IN THOUSANDS OF POUNDS
STROKE 50 INCHES 3.0 HOLE STROKES PER MINUTE 20
COUNTERBALANCE ROTARY & 7000 LBS ON PITMAN
DAILY PRODUCTION 230.3 BARRELS 141 GRAVITY 68.0 CUT
PUMP DISPLACEMENT 574.8 BARRELS PER DAY
VOLUMETRIC PUMPING EFFICIENCY 40.1 %
HORSEPOWER DELIVERED AT POLISHED ROD 11.93
HORSEPOWER THEORETICAL TO LIFT FLUID 7.32
MECHANICAL PUMPING EFFICIENCY 61.2 %

PLATE 24

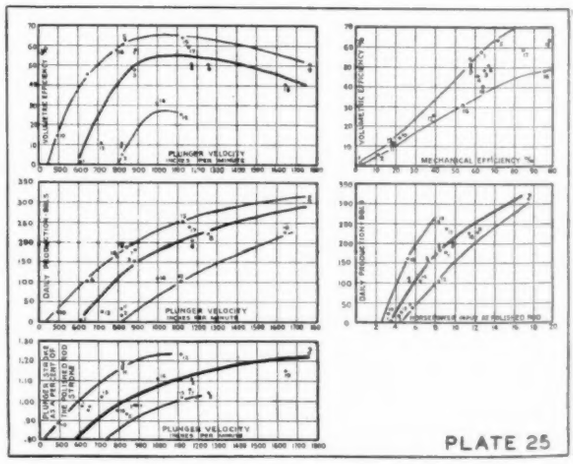


PLATE 25

duction and compared with the horsepower input at the polished rod. This result is the mechanical efficiency of the pump and the rods.

CONCLUSIONS

A number of interesting relationships are indicated in the results obtained from the sereis of tests and on Plate 25 several curves have been plotted which tend to educe them. As all of the data are based on one set of equipment, the curves are probably not applicable with any degree of exactness to other types, but they do bring out the fact that similar relationships may be expected to exist for all of the various types of pumps and pumping equipment.

Volumetric efficiency and plunger velocity are related as would be anticipated. The average curve through the points as plotted, shows that, as the plunger velocity is increased up to approximately 1000 inches per minute, the increase in volumetric efficiency is rapid with a maximum of nearly 70 per cent., but, with further increases in plunger velocity, the volumetric efficiency gradually diminishes. This is due to (1) more slippage at the lower velocities (2) less time for valves to function at the higher velocities. The average and minimum curves could be made to approach the maximum curve by decreasing the distance between the traveling valve and the standing valve at the bottom of the stroke and thus reducing the clearance in the pump which, with the presence of gas, greatly reduces the volumetric efficiency.

Daily production is likewise related to plunger velocity as indicated in the second series of curves. For the lower values, increases in production are more rapid in proportion to velocity increases than at the higher ones, proving the existence of a plunger velocity with which the best economic balance is obtained between production and rod fatigue.

The percentage elongation in plunger stroke over polished rod stroke is also directly related to the plunger velocity as shown by the third set of curves. The percentage elongation increases from 90 to 125 per cent. between plunger velocities of 500 and 1800 inches per minute. This relation permits of an estimated rod fatigue factor with respect to plunger velocity.

Mechanical efficiency is uniformly higher than volumetric efficiency as indicated by the fourth series of curves, the relative values being as 40 to 30 per cent.

The horsepower input at the polished rod necessary for various amounts of production is illustrated in the fifth series of curves. It is evident that the horsepower input increases more rapidly than the daily production.

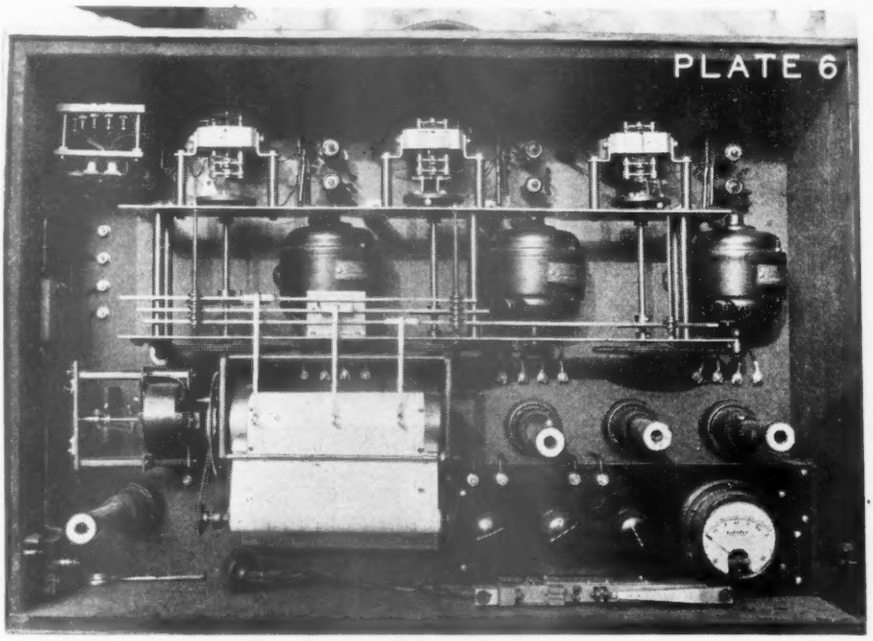
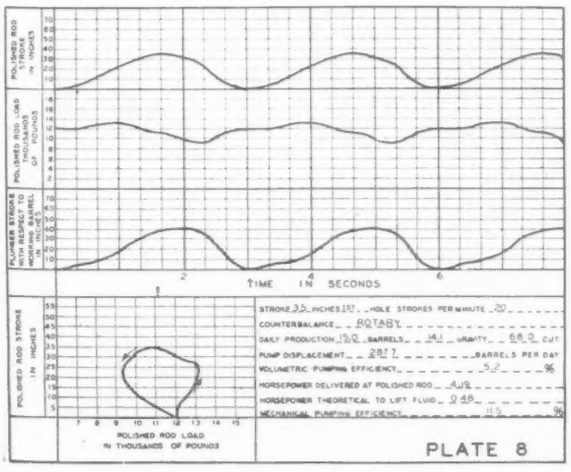
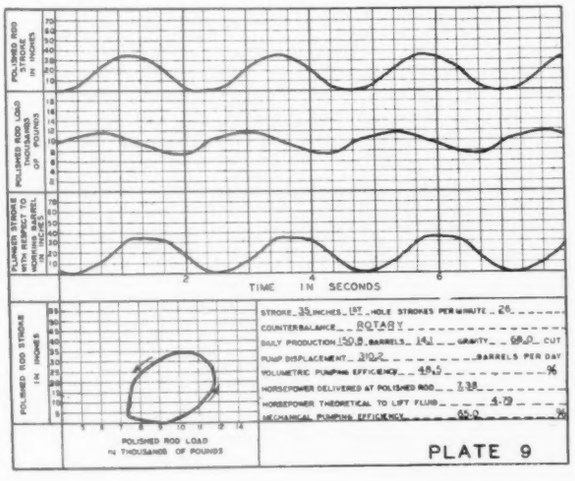


PLATE 6
The Dynamotograph

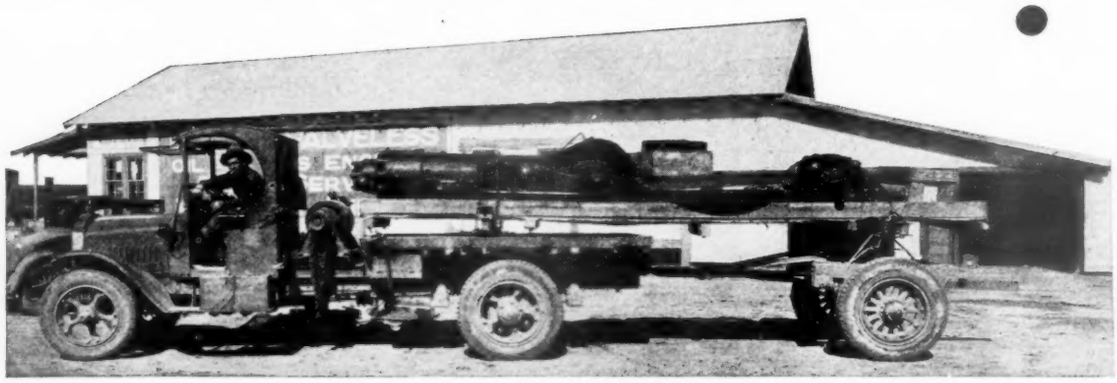
Referring again to the details of the test curves, various pertinent data are obtainable and valuable comparisons may be drawn relative to the merits of different operating conditions. The total polished rod load differential and the frequency, magnitude, and acceleration of load reversals furnish a valuable index of sucker rod impairment. The dissimilarity of the plunger stroke and the polished rod stroke, in relation to the volumetric and mechanical efficiencies, the amount of movement, and the relative time intervals of the curve, is important and adjustment of the optimum plunger stroke is made possible through a study of these curve characteristics. The time interval at the top and bottom of the plunger stroke indicates the permissable interval for valve action without reduction in volumetric efficiency. The relative time of the upstroke and downstroke brings out the percentage of the cycle during which slippage occurs. By reducing the slippage to a minimum without shortening the plunger stroke or the time interval for valve action, the maximum volumetric efficiency can be realized. It is evident that the polished rod horsepower input curve in its relation to the motion or stroke curves affords a means both of obtaining a higher mechanical pumping efficiency and of investigating rod fatigue. The importance of conducting this type of an investigation on various pumping equipment and operating conditions is evident and such investigations should result in more economic pumping practice.





FRANKLIN VALVELESS OIL AND GAS ENGINES

All Aboard!



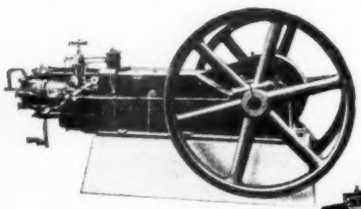
The Entire Franklin Engine is Easily Moved on One Truck Load—

One truck—that's all. And no overloading or straining of the truck.
The Franklin Engines are not bulky. Good material and scientific design give the Franklin Engine greater strength without useless weightiness.

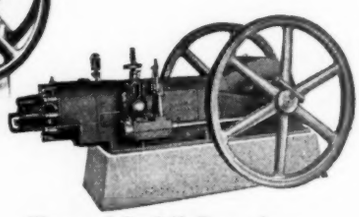
And loading the Franklin is as quick and efficient as a military movement. The few parts necessary to remove for loading come off easily, and are quickly assembled after unloading.

Yet, the best part of the Franklin is that you've got something when you get it set up. The Franklin Oil Drilling Engine has a fine record of performance. They show power, speed and flexibility.

The Franklin pumping engine displays a sturdiness that has gained many friends on the oil field. These pumpers come in 30, 40, 50 and 75 horsepower.



Type OF Oil Drilling Engine

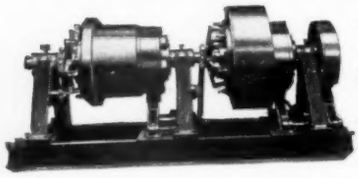


Type AO Oil Pumping Engine

Two speeds in either forward or reverse—all bearings enclosed —run in oil or grease.

All brake band and clutch discs adjusted without stopping the engine.

All brackets, bell cranks, toggle arms, brake cranks, levers, driving discs, spiders and sliding sleeves made of steel.

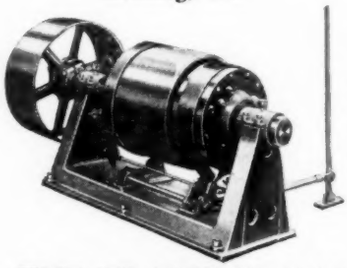


All similar parts of clutch interchangeable.

Belt driven — no shaft breakage.

The 2 SD Clutch will pull the largest bailer wthout faltering.

Type BG for Cable Tool Drilling, etc.



Here is a clutch that will operate satisfactorily and smoothly for cable tool drilling or for pumping operations. The BG type has one speed forward and reverse. It is much the same construction as the 2 SD clutch.

THE FRANKLIN VALVELESS ENGINE COMPANY
Franklin, Penna.

Distributed by

OIL WELL SUPPLY COMPANY

Branches in All Oil Fields

PERSONAL MENTION-MEN YOU KNOW

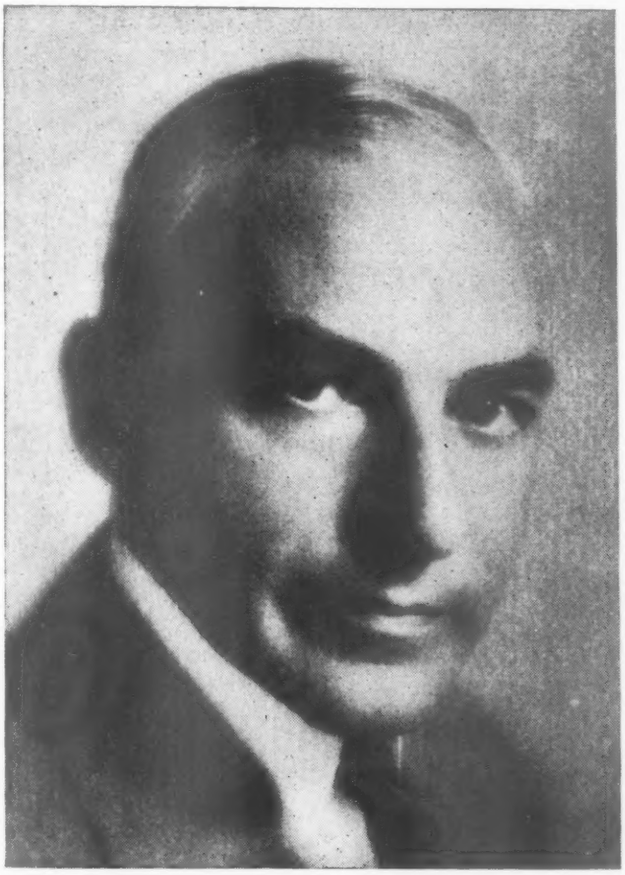
J. L. Shakely has been made executive vice-president in charge of the Western Division of the Frick-Reid Supply Corporation; and Robert McCoy, Jr., is in charge of sales and stores. Both of these men have been connected with the Frick-Reid organization in various capacities for 15 years. On December 1, O. A. Griffey became associated with the western division of the Frick-Reid Supply Corporation in charge of credits. He was formerly vice-president of the First National Bank & Trust Company of Tulsa, and before that a national bank examiner, with headquarters in Kansas City. There was a recent consolidation between the Frick-Reid Supply Company and the Frick & Lindsay Company, the former having operated west of the Mississippi, and the latter east of it. They are now known as the Frick-Reid Supply Corporation.

T. Rieber and **W. S. S. Rodgers** were elected directors of The Texas Corporation and of The Texas Company at a meeting held in New York, November 28. They succeed D. J. Moran and Jacques Vinmont, resigned. At this meeting F. T. Manley, manager of the refining department of The Texas Company, was elected a vice president of both The Texas Corporation and The Texas Company.

J. A. Holmes, manager of the research department of the Southern Crude Oil Purchasing Company in the Hendrick field, West Texas district, has been transferred to the New York City offices of the Pan-American Petroleum & Transportation Company.

Barto Jones, of Lake Charles, Louisiana, head of the land department, South Louisiana district, of the Standard Oil Company of Louisiana, was accidentally shot and killed while hunting on Monday, December 10. He is survived by his wife, formerly Miss Bertha Blake of Houston, and their two children. Mr. Jones lived in Beaumont, Texas, at one time. Prior to 1919 he was with the Gulf Refining Company of Louisiana at Shreveport, in an executive capacity; but at that time he began operating independently in the oil business; later joining the Standard Oil Company organization.

Hall Edwards, head of the land department of the Sunray Oil Company, Tulsa, was a visitor to the Indian Territory Illuminating Oil Company test shortly befort it blew in. Sun Royalty Company, composed of Sunray Oil Company personnel, owns a large amount of acreage in the vicinity.



JACQUES VINMONT

will be chairman of the board of directors of the recently organized Pacific Western Oil Company, which has acquired all of the oil producing properties in California formerly owned by Edward L. Doheny and his family. The properties are valued at more than $43,000,000. Mr. Vinmont was formerly president of the California Petroleum Corporation, a director of The Texas Company and president of The Texas Company of California.

J. M. Muir, chief geologist for the Mexican and Texas subsidiaries of the Warner-Quinlan Company, with headquarters at Dallas, Texas, has returned from Mexico, where several weeks were spent in making a study and mapping surface contours of a large area north of Tampico from an airplane.

E. C. Brown, formerly connected with the Miley Oil Company, has accepted a position as superintendent of Midway operations for the Italo-Petroleum Corporation. Mr. Brown was a well-known Mid-Continent lease superintendent before going to California.

J. A. Bermingham, vice-president of the Texas Production Company and in charge of operations in the Rocky Mountain States and Canada, returned to headquarters at Denver last week after making an inspection tour of the properties, involving a trip of about 2200 miles. Bermingham was formerly assistant division manager of the Central West Texas district for The Texas Company and moved from Fort Worth to Denver to assume his new duties last month.

Dick Hartman, scout for Cosden & Company, Fort Worth, was seriously injured December 2 when his automobile turned over on a highway west of Big Spring, and is now confined to a hospital at the latter city. Stanley Cosden, son of J. S. Cosden, was in the car, but escaped with minor injuries.

Miss Mary Lichenstein, formerly with the Gulf Publishing Company at Tulsa, has accepted a position with the Munger Oil Information Service at Los Angeles.

Laten Stanberry, for some time connected with the Moody-Seagraves interests at Shreveport, Louisiana, has accepted a position with the gas utilities division of the Texas Railroad Commission at Austin.

Oscar Hardy, assistant superintendent for the Shell Petroleum Corporation in the Hendrick field, West Texas district, has been transferred to Luling, Texas, to take charge of drilling campaign recently launched by Shell Petroleum Corporation in the Bruner, or Salt Flats field.

J. W. Gardiner, active vice-president of the Calcasieu Oil Company, die at his home in Lake Charles, Louisiana, December 10. Mr. Gardiner had been connected with the Calcasieu Oil Company, discoverer of the Kelso Bayou dome and several other salt domes in South Louisiana, since its organization about two years ago; and was actively interested in the development of the company's properties.

A. A. Buschow, secretary-treasurer of the Bridgeport Machine Company of Wichita, Kansas, is on a tour of the Oklahoma fields in connection with company business, visiting in Tulsa and other points last week.

Mountain States Field Development Notes

Question Government's Price Fixing Power

Casper, Wyo:—Some fine points of law will be brought out before the supreme court of the District of Columbia when the hearing for an injunction petitioned for by The Texas Company against the Secretary of the Department of the Interior, is heard. The Texas Company seeks to enjoin the Secretary from regulating the posted field price of crude petroleum other than royalty oil in the Oregon Basin field. The petition states that The Texas Company has a contract with Cody Petroleum Company to buy 1000 barrels per day of Oregon Basin crude petroleum at 53 cents per barrel and that if the department insists upon the Cody Petroleum Company charging a minimum of 85 cents The Texas Company will be financially the loser. The petition contends that the secretary has no legal right to fix the price of any but government royalty oil, and that in attempting to do so he is violating the contractural rights of the companies affected.

On the other hand the government believes that, under the provisions of the General Leasing Act, it has the right to say what are reasonable prices and even to fix these prices in the interest of conservation and the prevention of waste. It also claims the further right in consideration for what is the greatest good to the greatest number of persons, taking into consideration the future of the field, as well as the present.

What effect the filing of the suit will have upon the immediate development of the Oregon Basin field is yet to be seen. There has been no definite agreement made concerning proration in the field, nor for shutting down the drilling operations.

Montana Rejects All Bids for Royalty Oil

Helena, Mont.—Proposals of five refinery and purchasing companies to contract for the royalty oil accruing to the State of Montana from leased lands were rejected a week ago by the state board of land commissioners because of the varying stipulations accompanying the bids. There will be an advertisement of new bids which will permit separate proposals for the production of each individual oil field, instead of the production of all fields. The bids will be considered December 12.

Arro Refining Company, Maple Leaf Refining Company, Texas Production Company, Rainbow Refinery, and Shelby Pipe Line & Refining Company made bids variously affecting production of either or both of the Kevin-Sunburst and Pondera fields. The board also authorized the leases on 13 tracts of state land, totaling 4865 acres with an annual rental of $3648. The leases provide for a royalty of not less than 12½ per cent. on the gas and oil production.

Records of the board show that the state's royalty oil for the year ending November 1 amounted to 88,099 barrels which sold for $140,900.

Plan Tests in Wind River Valley, Wyoming

Casper, Wyo. — Reports from the Wind River Valley in Fremont County are to the effect that the Prairie Oil & Gas Company of Wyoming is operating a magnetometer in that region, with a view of spotting several test locations. In recent months there has been considerable scouting done in the valley, and it is believed by many that that district may have an active wildcat play in 1929.

Colorado Company Gets Wyoming Royalties

Denver, Colo.—Associated Royalty Company has been organized in Colorado and has taken over oil and gas royalties on 21 Wyoming structures from Phebus Brothers of Thermopolis and Robert Connaghan, Cheyenne land lawyer. Consideration was $325,000. The company has an authorized capital of 300,000 shares no par value, and $500,000 of seven per cent. preferred stock, divided into 10,000 shares with $50 par. Royalties include interests in Oregon Basin, Hudson or Lander, Enos Creek, Lake Creek, Grass Creek, Little Grass Creek, Muskrat, Frannie, South Frannie, Pitchfork, Four Bears, Elk Basin, Spring Creek, Skelton Dome, Miller Hill, Pilot Butte, and Sherrard Dome. Most of these structures are at present either operated or being tested by major operating companies. Executives are to be in Denver, and operating officers in Casper.

Humble Adding Storage Capacity at Ingleside

Houston.—Humble Pipe Line Company has started construction of five 64,000-barrel and two 80,000-barrel steel tanks at its West Texas oil line terminal near Corpus Christi, which, when completed, will increase total capacity there to 1,430,000 barrels.

Five 64,000-barrel tanks are being built on the 500-acre Ingleside refinery and storage site, where 10 tanks of 55,000-barrel capacity are already up. Two 80,000-barrel tanks are being built on the company's Harbor Island site, near the mainland, where five eighties are already up.

Another Pondera Pipe Line in Prospect

Great Falls, Mont.—It looks as if the Pondera field might have another pipe line outlet. The Pondera Pipe Line Company was recently incorporated in the office of the secretary of state at Helena with a capitalization of $50,000. Immediate plans of the company have not been organized.

EMSCO Announces Plant in England

Upon his return yesterday from Europe, E. M. Smith announced that the Emsco Derrick & Equipment Company, of which he is president, has purchased a substantial interest in an English manufacturing company, and will immediately reorganize the business to manufacture the same line of products made in the Emsco plants in the United States.

Under the name of Emsco Engineering, Ltd., the new British plant will manufacture and distribute oil well equipment in all foreign markets which can be more readily reached from England than from the American plants. The English plant is located at St. Albans, about 20 miles from London, and has been manufacturing oil well equipment and other products for the last 40 years.

Location Advantageous

Emsco Derrick & Equipment Company decided upon the location in England after investigating possibilities for an Emsco plant in Belgium, France and Germany. They found that the principal markets for oil well equipment in Russia, Poland, Rumania, the Dutch East Indies and South America are easily accessible from England. Some of the South American business, however, may be handled from the Los Angeles plant.

This year, Emsco Derrick & Equipment Company American plants, which are located in Houston, Dallas, and Los Angeles, will ship a large amount of equipment to foreign buyers. The inviting prospects for an increase in this business impelled the decision to establish a foreign plant.

By affiliating with a British company and manufacturing Emsco products in England, it is observed that they are following the course already adopted by other American manufacturers. The automobile and tire manufacturers, for example, have established British subsidiaries which are turning British-made goods for the British markets.

Around the first of the year Emsco Engineering, Ltd., will be operating on the new basis. The plant will be tripled in size at a cost of approximately $500.000.00.

Advantages of Large Diameter Wells in Exploitation of Oil Fields

By L. C. UREN,* F. F. DAVIS,** and W. L. JARVIS**

THE rate of production of an oil well, and the ultimate or total production obtainable from it, are determined primarily by the relation existing between the expulsive and retentive forces influencing the flow of oil through the reservoir sand. The oil has associated with it large volumes of natural gas under pressure. The energy furnished by this compressed gas is, in many cases, a fair measure of the total amount of energy available for oil expulsion. Opposing the expulsive force is a certain resisting or retentive force, which is a composite of a variety of physical factors resulting from the movement of the oil through the restricted pore spaces of the reservoir sand and the adhesive and capillary effects of the oil on and between the mineral grain surfaces.

The relative magnitude of these expulsive and resisting forces determines the rate at which the oil may flow through and from the reservoir sand into the drainage wells. For a given maximum value of the expulsive force, the lower the resisting force the more rapidly will the oil be produced. Also, the smaller the resisting force, the smaller will be the consumption of energy necessary to overcome it, and hence, with a given amount of energy available, more will be utilized in moving oil and the oil content of the sands will thus be more thoroughly expelled. It is apparent that anything that can be done to reduce the magnitude of the forces resisting expulsion will result in both an increased rate of recovery and in an increased ultimate recovery.

In an earlier paper,[1] the senior author has demonstrated that a large part of the energy consumed in moving oil into a drainage well is lost in the sands within a zone immediately about the well. Due to the radial characteristics of drainage to a well, the rate of flow of the oil must continually increase as the well is approached, the maximum flow velocity attained at the wall of the well. At the wall of a six-inch well the oil is flowing 40 times as fast as it is 10 feet back in the sand, and the resistance to flow offered by the sand increases as the rate of flow increases. Computations based on quantitative measurements of the resistance offered by sands to flow of fluids, indicate that more than half of the total energy consumed in moving oil over a 300-foot drainage radius to a six-inch well outlet is expended within the last 10 feet of reservoir sand immediately about the well. It follows that if this zone of high resistance is removed by drilling a well of larger diameter, or by reaming out a cavity within the oil sand about a well of ordinary diameter, both the rate of flow of the oil and the ultimate recovery of the well can be increased.

Present production practice is comparable with that of delivering oil through the small end of a funnel 300 feet long and 1200 times as large at one end as it is at the other. If the small end of the funnel could be cut off so that the outlet is 40 times as large as it was originally, obviously, the same volume of oil could flow through the funnel with less resistance; or, if the same pressure were made available at the large end, a greater quantity of oil could be made to flow through it with a given expenditure of energy. This is essentially what is accomplished when the diameter of a well with a drainage radius of 300 feet is increased from six inches to 20 feet.

Decreasing the resistance to flow through sand by 50 per cent. or more offers promise not only of increasing the recovery efficiency of oil from the sands, but also of greatly increasing the drainage radius of wells. With a given well-spacing the oil would be drained more quickly from a tract of land, leading to earlier realization on invested capital and to an increase in present value of prospective profits. In addition, a greater volume of oil would be secured than by present methods. Large-diameter wells would also permit the drainage of a given tract of land with a fewer number of wells, with consequent savings in development and operating expense. If the operator were content with a certain rate of recovery, it could probably be realized with half the number of large-diameter wells, finished with 20-foot cavities reamed about them within the oil sand, that is necessary with present small-diameter wells, and in the operation of these wells, due to the reduction in the number and greater production rate per well, in many cases the lifting cost could probably be reduced by 50 per cent. or more.

Some interesting experiences demonstrating the advantages of well cavities, or large-diameter wells, are found in fields where land is held in small tracts and highly competitive conditions exist. The necessity for prompt offsetting of wells along property lines is a time-honored tra-

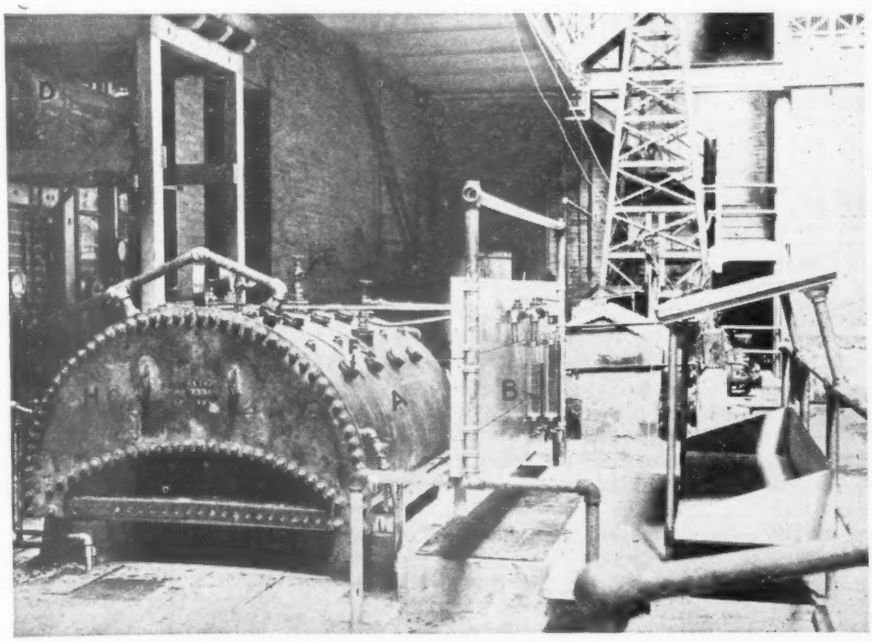


FIGURE 1

A, sand-filled tank; B, receiving cylinders; D, absorber; E, miniature wells; F, sampling nipples; H, removable end of tank.

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**Senior Petroleum Engineering Students, University of California, Berkeley, California.

[1] Uren, L. C., Increasing Production of Petroleum by Increasing Diameter of Wells, Trans. A. I. M. & M. E., Vol. LXXI, pages 1270-1300 (1925).

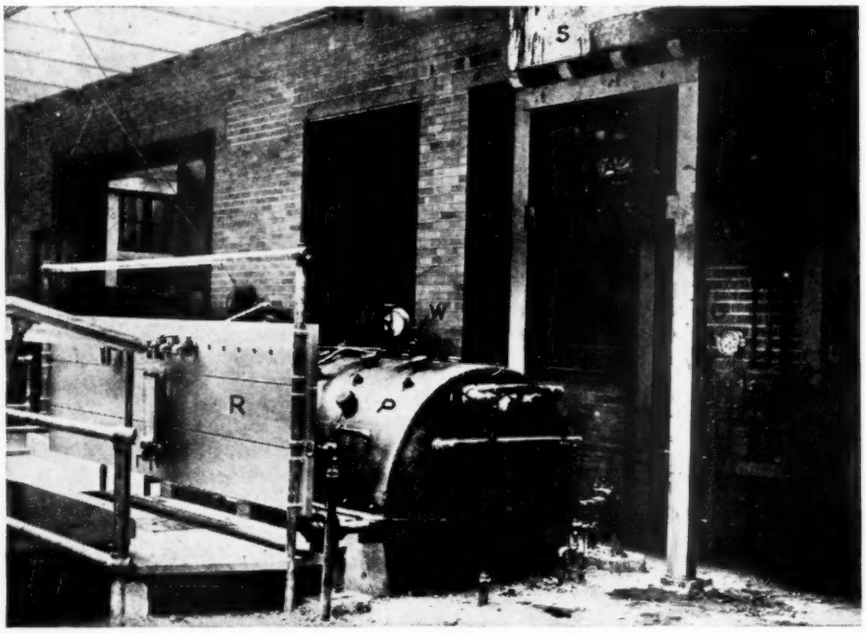


FIGURE 2

Sand-filled pressure tank used in drainage experiments, Petroleum Laboratories, University of California. P, pressure tank; S, storage tank; A, absorber tank; R, receiving board; C, control valves; W, miniature well.

dition of the oil-producing industry. To the owner of the early wells in a new area goes the greater volume of recoverable oil. His wells have the greatest initial rate of production and a better sustained flow. This, however, is not necessarily true if the late-comer or less aggressive land owner in the area drills wells of larger diameter or forms enlarged cavities within the oil sand about them. As will be shown in the following discussion, it is quite possible that an operator following such a policy might complete his wells many months after the earlier wells are placed on production and yet secure larger ultimate recoveries and higher rates of recovery.

A LABORATORY STUDY OF THE ADVANTAGES OF LARGE DIAMETER WELLS

Impressed with the apparent advantages of large diameter wells, from the theoretical standpoint, and with dearth of field data that would permit the demonstration of such advantages quantitatively, the authors have conducted a series of experiments in laboratory apparatus, designed to show conclusively the superior drainage efficiency of the large-diameter well.

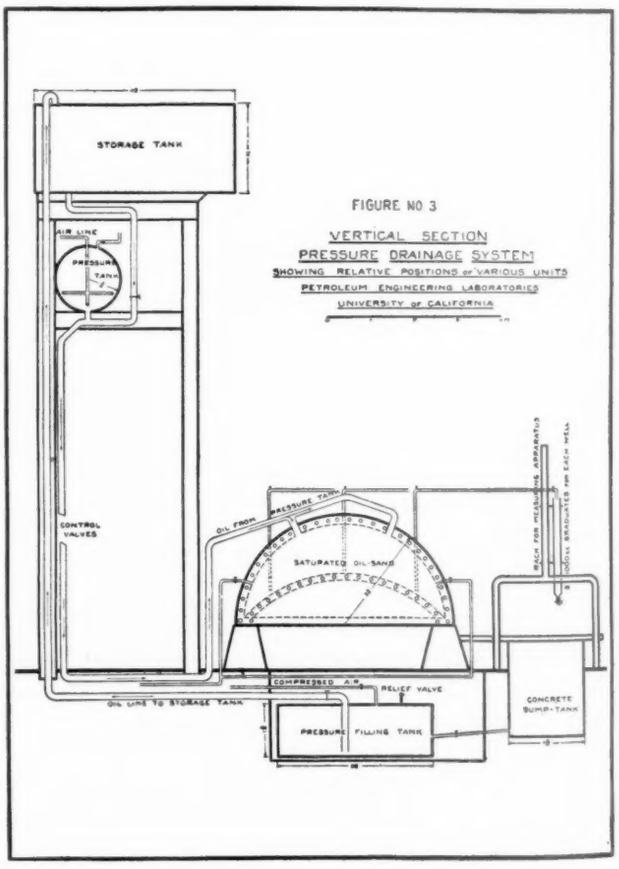
For studies of this character, laboratory apparatus affords a better means of securing comparative data than is possible to find in actual field records. An oil field may be exploited only once, by one method or sequence of methods, and it may never be known but that some other method or sequence of methods would have produced better results. The field records are often difficult to interpret and the effect of different variables are not accurately measurable. In the laboratory, on the other hand, different experiments may be conducted under carefully controlled conditions, and in successive ones all initial conditions may be precisely alike. Furthermore, in the laboratory the sand and pressure conditions and the efficiency of recovery may be determined with a degree of accuracy not possible in field studies.

In addition to increased recovery, other important advantages result through reduction of the flow velocity of the oil within the reservoir sand in the critical area immediately about the wells. If the velocity of approach is low, there will be less rapid expansion of the associated natural gas and consequently less chilling effect on the oil. Avoidance of this chilling effect means less deposition of paraffin within the wall rocks and a lower average oil viscosity. The carrying capacity of oil for float sand, shale and other detrital material increases with its velocity of flow. Therefore, in fields where the reservoir sand disintegrates readily, and where loose material tends to accumulate about or within the well screens, perforated liners, gas anchors or pumps, the condition may be alleviated through reduction of the flow velocity of the oil by increasing the well diameter.

DESCRIPTION OF APPARATUS

The experimental results presented in this paper were secured with the aid of a pressure-drainage tank filled with oil-saturated sand, the oil being charged with dissolved gas under pressure, making a miniature oil field with small "wells" in the form of perforated pipes penetrating the sand body vertically, through which the oil may be drained. In this apparatus, which is a part of the equipment of the petroleum laboratories of the University of California, it is believed that all of the conditions attending the occurrence of petroleum in the field have been duplicated in a small way. The photographs reproduced in Figures 1 and 2 give the general form and appearance of the pressure drainage tank, and Figures 3 and 4 shows its dimensions and the arrangement of the incidental equipment.

An elevated rectangular tank, A—Figure 2, is provided for oil storage and has a capacity of about eight barrels. The cylindrical tank, B, immediately below, is designed for



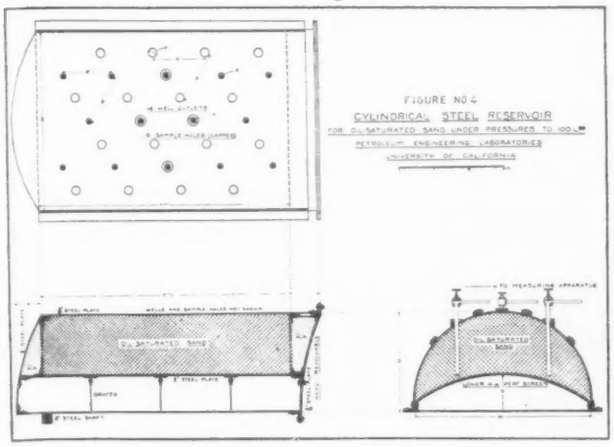


FIGURE NO 4
CYLINDRICAL STEEL RESERVOIR
FOR OIL-SATURATED SAND UNDER PRESSURES TO 100 LBS
PETROLEUM ENGINEERING LABORATORIES
UNIVERSITY OF CALIFORNIA

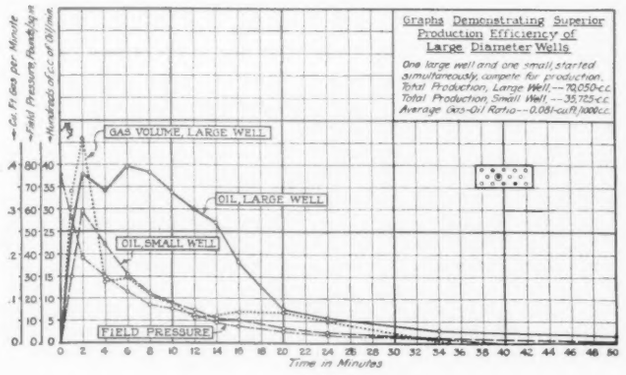

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large well and one small, started simultaneously, compete for production.
Total Production, Large Well.--70,050-c.c.
Total Production, Small Well.--35,725-c.c.
Average Gas-Oil Ratio.--0.081-cu.ft./1000-c.c.
GAS VOLUME, LARGE WELL
OIL, LARGE WELL
OIL, SMALL WELL
FIELD PRESSURE
Time in Minutes

FIGURE 8.

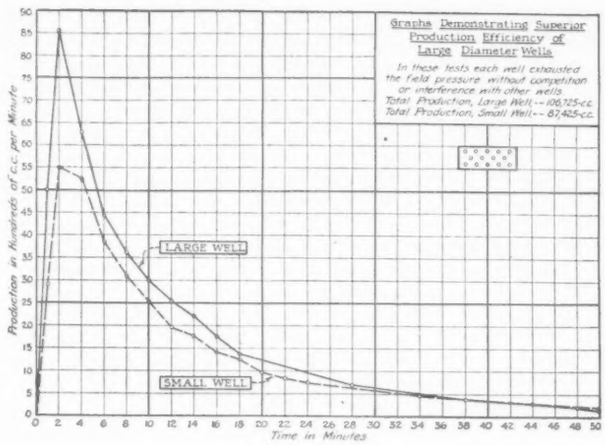

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
In these tests each well exhausted the field pressure without competition or interference with other wells.
Total Production, Large Well.--106,125-c.c.
Total Production, Small Well.--87,425-c.c.
LARGE WELL
SMALL WELL
Production in Hundreds of C.C. per Minute
Time in Minutes

FIGURE 5.

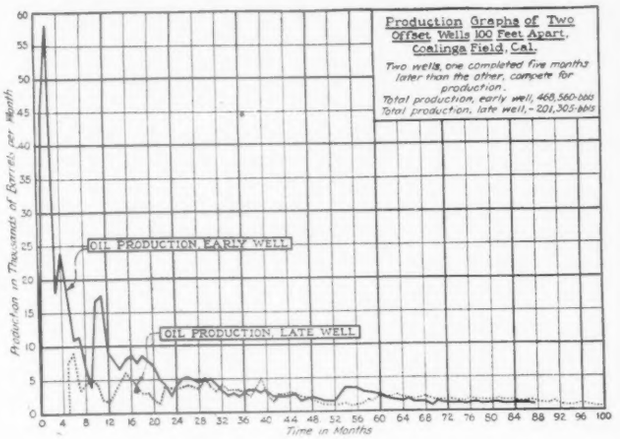

Production Graphs of Two Offset Wells 100 Feet Apart, Coalinga Field, Cal.
Two wells, one completed five months later than the other, compete for production.
Total production, early well, 468,560-bbls
Total production, late well,-201,305-bbls
OIL PRODUCTION, EARLY WELL
OIL PRODUCTION, LATE WELL
Production in Thousands of Barrels per Month
Time in Months

FIGURE 9.

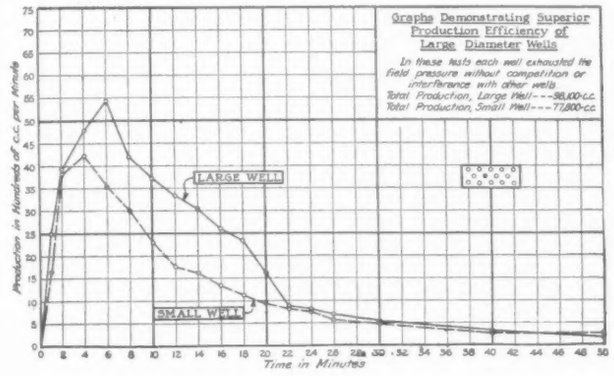

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
In these tests each well exhausted the field pressure without competition or interference with other wells.
Total Production, Large Well.---98,100-c.c.
Total Production, Small Well.---77,800-c.c.
LARGE WELL
SMALL WELL
Production in Hundreds of C.C. per Minute
Time in Minutes

FIGURE 6.

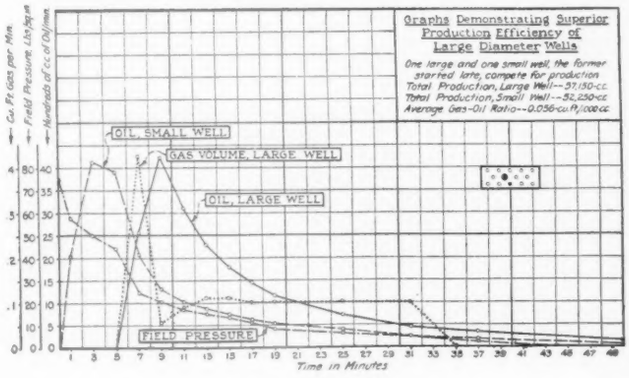

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large and one small well, the former started late, compete for production
Total Production, Large Well.--57,150-c.c.
Total Production, Small Well.--52,250-c.c.
Average Gas-Oil Ratio.--0.056-cu.ft./100-c.c.
OIL, SMALL WELL
GAS VOLUME, LARGE WELL
OIL, LARGE WELL
FIELD PRESSURE
Time in Minutes

FIGURE 10.

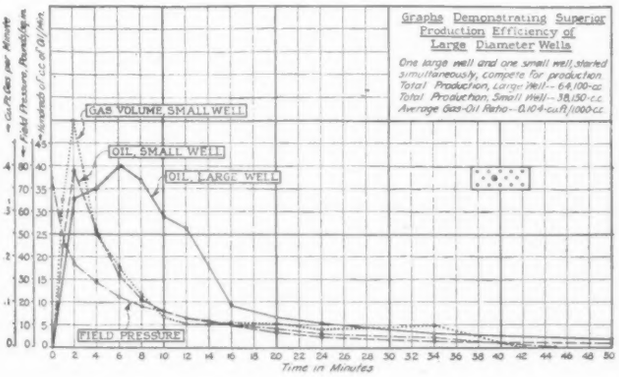

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large well and one small well, started simultaneously, compete for production.
Total Production, Large Well.--64,100-c.c.
Total Production, Small Well.--38,150-c.c.
Average Gas-Oil Ratio.--0.104-cu.ft./1000-c.c.
GAS VOLUME, SMALL WELL
OIL, SMALL WELL
OIL, LARGE WELL
FIELD PRESSURE
Time in Minutes

FIGURE 7.

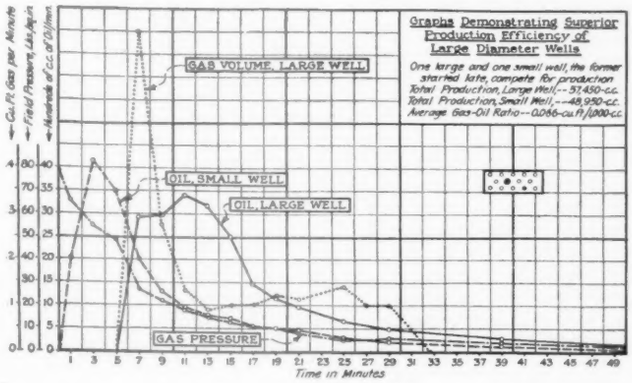

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large and one small well, the former started late, compete for production
Total Production, Large Well.--57,450-c.c.
Total Production, Small Well.--48,950-c.c.
Average Gas-Oil Ratio.--0.066-cu.ft./1000-c.c.
GAS VOLUME, LARGE WELL
OIL, SMALL WELL
OIL, LARGE WELL
GAS PRESSURE
Time in Minutes

FIGURE 11.

high pressure, and is used for gauging and as an absorber for charging the oil with air or gas under pressure. Oil may be passed from the storage tank into the cylindrical absorber, and after saturating it with gas under pressure it is injected into the sand-filled pressure tank. The last is semi-cylindrical in form, reinforced with a plate rolled to a greater radius than the semi-cylindrical shell to which it is welded and riveted. The space between this curved plate and the semi-cylindrical shell is crescent-shaped and is filled with oil-saturated sand. The tank is five feet in diameter and eight feet long, and is designed for a maximum pressure of 100 pounds per square inch. The dished end of the tank, seen in Figure 1, is removable, an oil-proofed composition gasket preventing leakage.

With the aid of a chain hoist the pressure tank may be lifted on end. The two-inch steel shaft and concrete pedestal shown in Figure 2 serves to support the weight of the tank, which is filled with sand while in this position. The sand is moistened with oil and thoroughly tamped as it is introduced. By piling sand above the top of the flange and then forcing the gasketed head into place with the bolts, the sand can be so compressed that no voids exist after the tank is lowered to the horizontal position. Pipe manifolds are then connected to each end of the tank, through which the sand is charged with gas-saturated oil from the absorber tank.

The cylindrical shell of the tank is perforated by 30 threaded nipples, securely welded to the shell, designed to support the miniature "wells." These consist of brass tubes about three feet long which penetrate the full depth of the sand within the tank (about 20 inches.) The well tubes are perforated near their lower ends with spiral slots which admit oil freely but which are too narrow to admit sand. An angle valve at the upper end of each "well" is used to control the flow of oil from the tank. Horizontal pipes connecting with these valves lead the oil to the control board placed at one side of the tank; here the oil delivered by the individual lead lines is received in suitable containers and accurately measured. After measurement the oil is permitted to drain into a concrete sump below the control board, whence it occasionally drawn into a small pressure tank and pumped to the main storage tank.

Connections are proviedd in the cylindrical shell of the sand-filled pressure tank for twenty wells, some of which may be as large as three inches in diameter. Equidistant between the wells are 10 two-inch capped nipples, also penetrating the tank shell, through which samples of the sand within the tank may be secured with a core sampler to determine sand saturation and porosity at various points.

In conducting an experiment, gas-saturated oil is charged into the sand-filled tank under a pressure of about 80 pounds per square inch. Pressure gauges connecting through the tank shell with the sand body at various points indicate the "field pressure" at all times. One or more wells, as the particular experiment may require, are then opened and permitted to flow until pressure within the tank is exhausted. The volume of gas flowing from any well may be determined by passing the flow of gas and oil through a small trap where the gas is separated and measured by a wet-test meter. By recording the volumes of gas and oil flowing from the trap at brief intervals, the "gas-oil ratio" may be computed. Plotting the volumes of oil flowing from individual wells within constant time intervals gives characteristic decline curves which are identical in form with those secured from the field data. An individual well will continue to flow for an hour or more while pressure with in the sand body is being gradually exhausted. During the early stages of flow, the wells at times "flow by heads" and are similar in other ways to actual producing wells in oil fields.

TEST CONDITIONS

In this particular series of experiments the sand body was left undisturbed and the same grade of oil was used throughout. The sand used was a medium size of beach sand, tamped to a porosity of about 32 per cent. The oil was a Los Angeles Basin crude of 25 degree A. P. I. gravity. The temperature remained approximately constant at about 65 degrees F. throughout the period of the tests. The oil had a kinematic viscosity of 1.081-poises, or about 500-second Saybolt. Compressed air was used to charge the oil. While only about half as soluble as natural gas, the same relative expulsive effects are secured. Occasional viscosity tests of the oil were made to detect any possible oxidation of the oil, and fresh oil was added from time to time to keep this property constant. Successive experiments were all started with an initial "field pressure" of approximately 80 pounds per square inch.

Since the purpose of the experiments was to determine the effect of well diameter on the rate of efficiency of recovery, two sizes of wells were used: "Small wells" having an external diameter of one inch, and a "large well" 3.5 inches in external diameter. The lead lines are of ¾-inch pipe in each case. In different experiments the wells were placed in such positions with respect to each other as the particular problem required. In general, the locations assumed were comparable with those frequently presented in fields exploited under competitive conditions, the experiments being planned particularly to display the advantages that large wells might possess over small wells under such circumstances. Small key-sketches on the various graphs, which display the experimental data, indicate the location of the wells with respect to each other and with respect to the tank shell. The rate of oil production for each well was recorded at two-minute intervals, with corresponding readings of the gauges recording the "field pressure." In a few experiments the gas volumes flowing from individual wells were also measured at two-minute intervals, affording a means of computing gas-oil ratios.

COMPARATIVE PRODUCTION EFFICIENCIES OF SINGLE LARGE AND SMALL UNINFLUENCED WELLS

Two parallel experiments were performed under identical conditions, except that in one case a small diameter (one-inch) well was used and in the other a large diameter (three-inch) well was used. Both gas and oil volumes were measured at two-minute intervals. The results are recorded graphically to facilitate comparison—Figure 5. The small well produced 87,425 cubic centimeters while the large well produced 106,725 cubic centimeters, or 1.22 times as much as the small well. The large well had a maximum rate of production of approximately 1.54 times that of the small well.

In another pair of experiments of like character, the results of which are presented in Figure 6, the wells were placed at the crest of the "structure," a somewhat less favorable situation for efficient oil production due to more rapid escape of the gas from the sand. In these experiments the small well produced 77,800 cubic centimeters and the large well 98,100 cubic centimeters, or 1.26 times as much as the small well. The highest rate of production for the large well was 1.3 times that of the small well. As long as gas pressure persisted in the sand, the production of the large well was consistently higher than that of the small well, though toward the end of the runs the difference was slight.

These experiments indicate that a well of large diameter not only develops a greater production rate but also has a greater ultimate or total production. The latter may result either through a more complete drainage of the uninfluenced area or a greater radius of drainage. The experiments do not indicate which of these possibilities is chiefly responsible for the improved result, but theory suggests that in all probability both contribute. The productive life of the large well is as great as that of the small well, and the two have about the same rate of decline, which is indicative of a greater drainage radius for the large well.

COMPARATIVE PRODUCTION EFFICIENCIES OF "OFFSET" WELLS

One Large and One Small Well "Brought In" Simultaneous

Two wells, one a large-diameter (three-inch) well on the crest of the "structure" and the other a small-diameter (one-inch) well in the next "down-dip" location, were brought in simultaneously. Figure 7 gives the production records for the two wells. The combined production of both was 102,250 cubic

centimeters, of which the small well produced 38,150 cubic centimeters, or 37 per cent. The results of a similar test with the wells somewhat further apart are given in Figure 8. Here a slightly greater total recovery was secured, 105,800 cubic centimeters, of which the small well produced 33.8 per cent. and the large well approximately twice as much, or 66.2 per cent.

In these experiments it will be noted that the large-diameter well again develops a somewhat higher initial rate of production than the small well, but that the superior recovery efficiency of the large well, from the standpoint of ultimate recovery, is due rather to a well-sustained rate of production over a considerable period of time, while the small well is rapidly declining. This again is indicative of a greater drainage radius for the large-diameter well.

One Small and One Large, the last Being "Brought In" Late

For example, assume that operator A has completed a well on one side of the boundary line between his property and that of operator B, and that operator B has been unable to complete his "offset" well until some months have elapsed. Normally, under such circumstances B's well would have a comparatively smaller initial and ultimate production thant that of A, due to partial gas and oil drainage of his land by A's well while the earlier well had uncontested possession of the area within its influence. Under the circumstances assumed it would normally be expected that A's well would always be a larger well than that of B throughout their productive lives. The production records of actual offset wells, reproduced in Figure 9, are typical. Here, it will be noted, the late well had an initial production of only 16 per cent. of the earlier well, and an

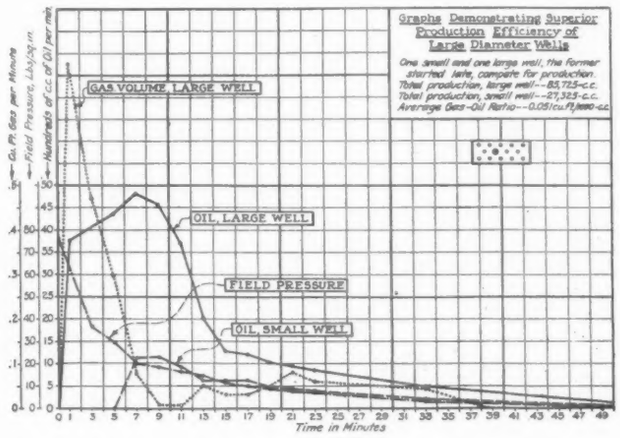

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One small and one large well, the former started late, compete for production.
Total production, large well--83,725-c.c.
Total production, small well--27,325-c.c.
Average Gas-Oil Ratio--0.051cu.ft./1000-c.c.
GAS VOLUME, LARGE WELL
OIL, LARGE WELL
FIELD PRESSURE
OIL, SMALL WELL
Time in Minutes

FIGURE 12.

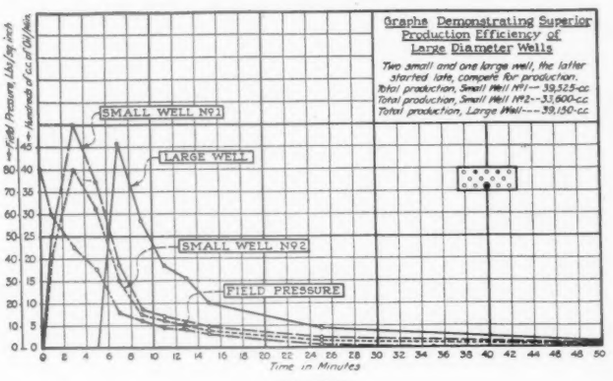

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
Two small and one large well, the latter started late, compete for production.
Total production, Small Well №1--39,525-c.c.
Total production, Small Well №2--33,600-c.c.
Total production, Large Well---39,150-c.c.
SMALL WELL №1
LARGE WELL
SMALL WELL №2
FIELD PRESSURE
Time in Minutes

FIGURE 15.

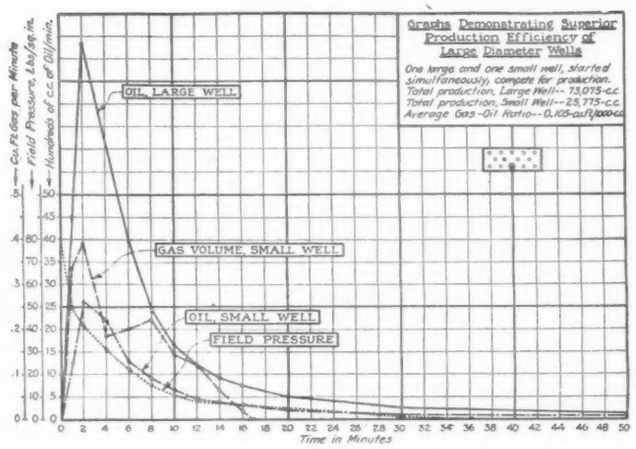

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large and one small well, started simultaneously, compete for production.
Total production, Large Well--73,075-c.c.
Total production, Small Well--25,775-c.c.
Average Gas-Oil Ratio--0.105-cu.ft./1000-c.c.
OIL, LARGE WELL
GAS VOLUME, SMALL WELL
OIL, SMALL WELL
FIELD PRESSURE
Time in Minutes

FIGURE 13.

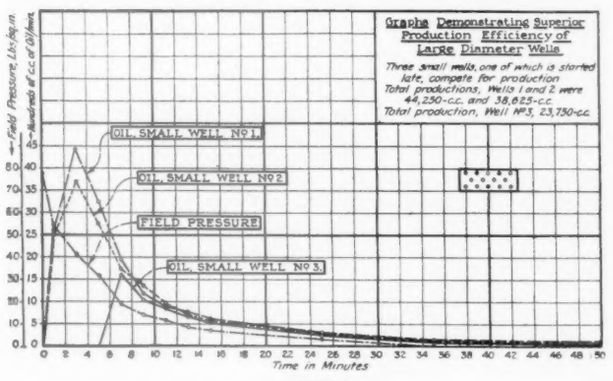

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
Three small wells, one of which is started late, compete for production
Total productions, Wells 1 and 2 were 44,250-c.c. and 38,625-c.c.
Total production, Well №3, 23,750-c.c.
OIL, SMALL WELL №1
OIL, SMALL WELL №2
FIELD PRESSURE
OIL, SMALL WELL №3
Time in Minutes

FIGURE 16.

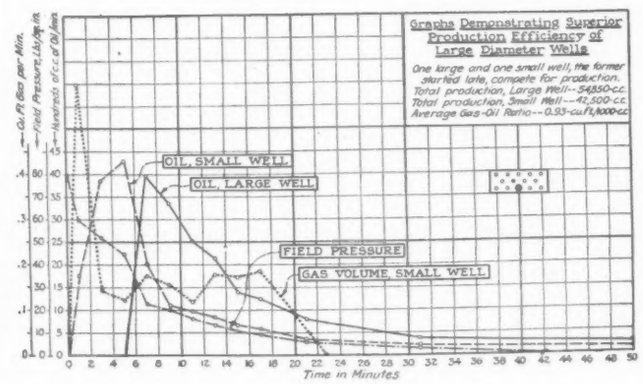

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
One large and one small well, the former started late, compete for production.
Total production, Large Well--54,850-c.c.
Total production, Small Well--42,500-c.c.
Average Gas-Oil Ratio--0.93-cu.ft./1000-c.c.
OIL, SMALL WELL
OIL, LARGE WELL
FIELD PRESSURE
GAS VOLUME, SMALL WELL
Time in Minutes

FIGURE 14.

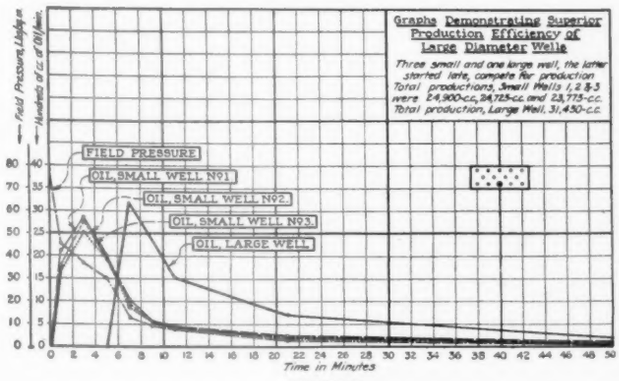

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
Three small and one large well, the latter started late, compete for production
Total productions, Small Wells 1, 2 & 3 were 24,900-c.c., 24,725-c.c. and 23,775-c.c.
Total production, Large Well, 31,450-c.c.
FIELD PRESSURE
OIL, SMALL WELL №1
OIL, SMALL WELL №2
OIL, SMALL WELL №3
OIL, LARGE WELL
Time in Minutes

FIGURE 17.

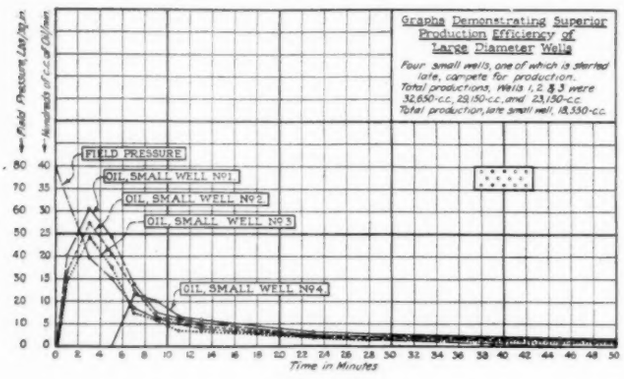

Graphs Demonstrating Superior Production Efficiency of Large Diameter Wells
Four small wells, one of which is started late, compete for production. Total productions, Wells 1, 2, & 3 were 32,650-c.c., 23,150-c.c., and 23,150-c.c. Total production, late small well, 18,350-c.c.
FIELD PRESSURE
OIL, SMALL WELL No1
OIL, SMALL WELL No2
OIL, SMALL WELL No3
OIL, SMALL WELL No4
Time in Minutes

FIGURE 18.

ultimate recovery of only 43 per cent. of the earlier well. The loss was suffered by the owner of the later well through a delay of only five months in its completion. The senior author has in his possession the production records of several hundred offset couples and in practically every case where as nearly as can be determined the wells were properly completed and produced under similar conditions, the earlier well developed and maintained a high rate of production and had a greater ultimate production.

In an effort to determine to what extent the owner of a late completion might be able to regain some of the production lost to earlier offset wells by the drilling of wells of larger diameter, a series of experiments was performed and the results of one of these are displayed graphically in Figure 10. For this experiment the pressure drainage tank was equipped with two wells, one one-inch in diameter and the other three-inches in diameter, in adjoining locations as shown in the inserted sketch. With the initial field pressure adjusted at 75 pounds per square inch the small well was opened and permitted to produce alone for five minutes. The large well was then "brought in," after which both wells produced simultaneously. When drainage from both wells had ceased, measurement of the oil produced showed that the early, small diameter well, had a total yield of 52,250 cubic centimeters, and the late, large diameter well, 57,150 cubic centimeters. The graph also shows as "field pressure" the pressure within the sand body at a point remote from the wells during the test.

The results of this experiment show that though the late well was not permitted to produce until the small early well had secured a large part of the "flush" production, and had reduced the "field pressure" from 75 to 44 pounds per square inch, the large well was still able to overcome its handicap and produce about 9 per cent more oil than its competitor. It is also interesting to note the rapidity with which the rate of production of the small well decreased after the large well was "brought in." The authors believe that if, in Figure 10, "time in months" is substituted for "time in minutes," and "barrels" for "cubic centimeters," the graphs might be a fair indication of what could be expected in the field were one well with a diameter of two feet allowed to compete with an offset six inches in diameter under the conditions assumed.

The results of a similar experiment, except that the wells were placed two locations apart instead of one, are displayed in Figure 11. Here again the large diameter well produced 57,450 cubic centimeters as against 48,950 cubic centimeters for the small diameter well. This represents an additional recovery of 18 per cent. for the large well although it was handicapped by a delay of five minutes in the time of starting, and produced from an initial "field pressure" 30 pounds less than that enjoyed by the small well. The interference effects on the productivity of the small well are not quite so apparent in these graphs as in those of Figure 10 due to the wider spacing.

An interesting contrast is afforded by another experiment, the results of which are shown in Figure 12. Here the large diameter well was started first and the small diameter well produced under a five minute handicap. The early large well in this case produced 3.14 times as much oil as the small late well. It will be noted also that in this experiment the large well continued to increase in productivity for some time after the small well was "brought in" and at all times had a matrially greater production than the small well, thus demonstrating how completely it dominated the region in which both wells were located.

It has been previously stated that in the pressure drainage tank experiments "crest" wells produce less efficiently than do wells in the "flank" positions. The results of two experiments similar to those already described, except that the large diameter well was placed in a "flank" location and the small diameter well on the crest, will demonstrate this. Figure 13 presents the result of a competitive "run" in which a one-inch well on the "crest" and a three-inch well on the "flank" were brought in simultaneously and allowed to produce until oil no longer flowed from either. The large well had an ultimate production 2.84 times that of the small well. This, it will be noted, is a considerably better result than was secured with the large well in the "crest" position. (See Figure 7.)

Figure 14 presents the results of an experiment comparable with that represented by Figure 10 except that the positions of the competitive wells are reversed, the large well being placed on the flank of the "structure" and the small well on the crest. The large well is again handicapped by giving its competitor a five minute start. Although producing from an initial field pressure of only 35 pounds per square inch instead of 80 pounds, the large diameter well overcame its handicap and produced a total of about 30 per cent. more oil than its competitor. In Figure 14, from the volume of gas produced it will be seen that the large well is much more efficient in its gas-oil ratio than the small well, the latter producing with an average ratio of 0.93 cubic feet per thousand cubic centimeters of oil, while the large well, in a similar position and under similar circumstances, produced with an average ratio of only 0.66.

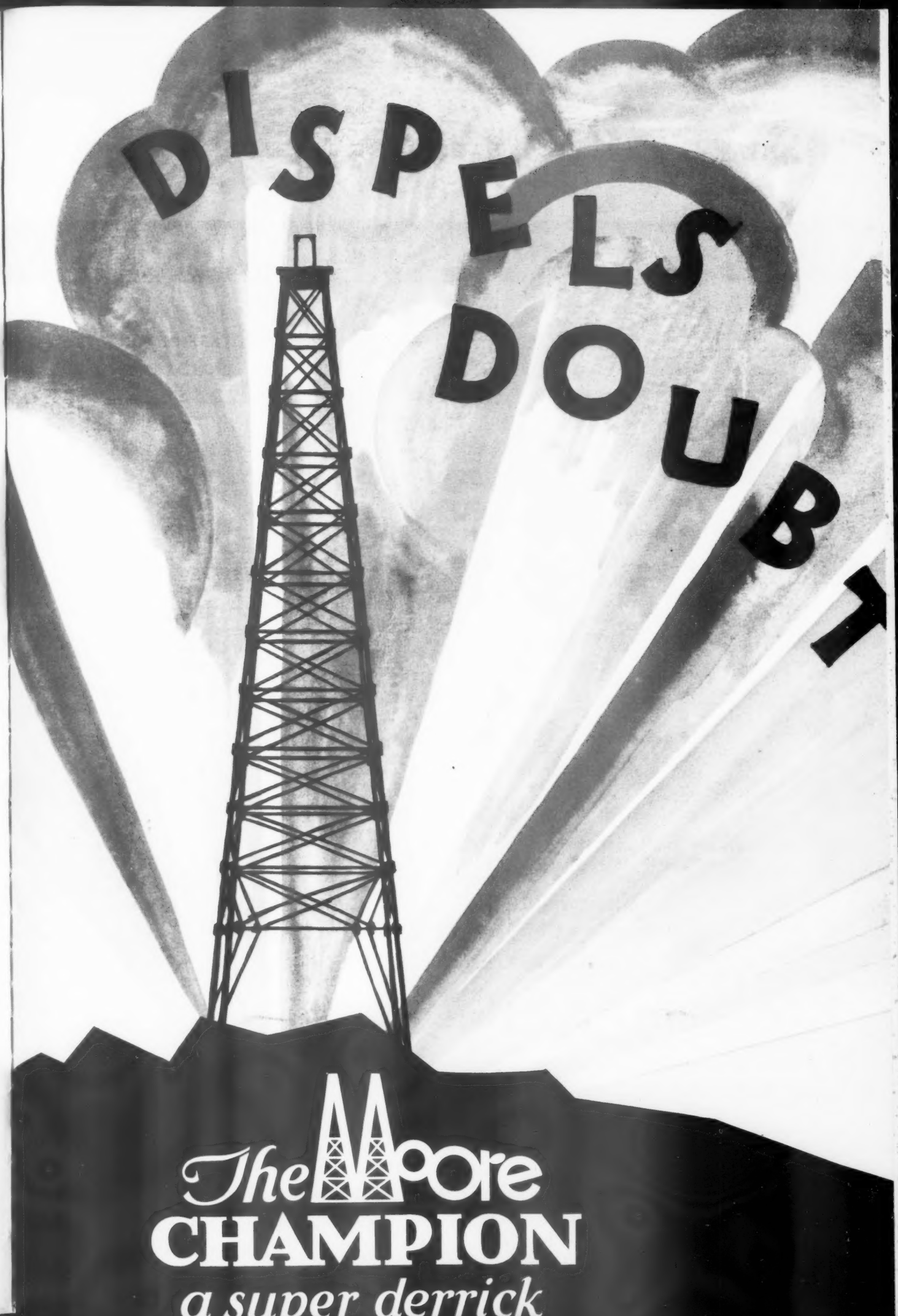
Two Small Wells Competing With One Large, the Last Being "Brought In" Late

In competing with neighboring drilling operations along a property boundary, it will often happen that the neighbor drills and completes wells before the operator is in a position to offset, or perhaps the neighbor is able to operate more "strings of tools" simultaneously, thus enabling him to complete his boundary wells sooner. Normally, under such circumstances, the more aggressive neighbor will secure a larger ultimate recovery from his wells. However, if the operator drills wells larger than the neighbors, or forms enlarged cavities within the oil sand about them, he may be able to keep pace with his neighbor's development operations with a fewer number of wells. That is, one large-diameter well may offset two small-diameter wells, the large well producing as much as the two small diameter offsets. Or, if the slower development program permits the neighbor's wells to partially deplete the field pressure before the operator's wells are placed on production, lost production may be regained at the expense of the neighbor's future production by completing wells with a larger diameter.

To demonstrate this principle an experiment was performed in the pressure tank in which two one-inch wells were "brought in" simultaneously and allowed to produce for a period of five minutes before opening a third well 3½ inches in diameter. Figure 15 gives the results. It will be noted that the late large-diameter well produced almost as much as the best of the earlier small diameter wells, although it produced from an initial field pressure. Figure 16 shows the results of a similar experi-small diameter wells had the advantage of an 80-pound initial field prossure. Figure 16 shows the results of a similar experiment in which the late well was the same diameter as the two earlier small-diameter wells. It is interesting to note that the large-diameter well of Figure 15 produced 2.11 times as much as did the small-diameter well of Figure 16 under similar conditions.

Three Small Wells Competing With One Large, the Last Being "Brought In" Late

At a section corner or other intersection of two property lines where a drainage area is of interest to four property owners, a highly competitive situation is created. Each of the four producers rushes the completion of this corner location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with all possible speed in order to secure his share of the "flush" oil that flows from the sands in abundance only while the field pressure is high. The producer who allows even a few months to intervene between the completion of his neighbors' wells and his own loses heavily in most cases. This is not necessarily true, however, for if the owner of the late well, recognizing the superior drainage efficiency of large diameter wells, reams a cavity about his well within the oil sand, he may regain much of his lost production, and if the delay in completion is not too great, he may even secure a greater ultimate recovery than his neighbors.

Figure 17 gives the results of an experiment, conducted with the aid of the pressure-drainage tank, in which four wells are situated at the corners of a square, three being one-inch in diameter and the fourth 3½ inches. The three small-diameter wells were started simultaneously and allowed to produce for five minutes before the large-diameter well was brought in. The field pressure had meanwhile decreased from 80 pounds per square inch to 30 pounds. The large-diameter well nevertheless ultimately produced 26 per cent. more oil than the best of its competitors and throughout the greater part of its life had a production rate of from two to three times that of either of the other three wells. Figure 18, presenting the results of a similar experiment in which all four wells were of the same diameter (one-inch), shows what the normal result would be under present field practice. Here the late small-diameter well produces only 74 per cent. as much as the best of its competitors, and only 59 per cent. of what the large-diameter well of Figure 17 produced under similar conditions.

SUPERIOR DRAINAGE EFFICIENCY OF LARGE DIAMETER WELLS AS EVIDENCED BY LOW GAS-OIL RATIOS

Within recent years there has been general recognition of the principle that the ratio of gas to oil produced by a well is indicative of the efficiency of expulsion. The volume of gas, considered in its relation to the field pressure from which it expands, is a satisfactory measure of the energy consumed in forcing the oil through the sands and into the well.

In a number of experiments described herein both gas and oil produced by particular wells were measured. Figures 7, 8, 10, 11, 12, 13 and 14 give both gas pressure and gas volume decline curves extending over the same periods as the oil production graphs. The average gas-oil ratio has been computed and is indicated in each case. In some of these experiments the gas flowing from the small-diameter well has been measured, in other cases that flowing from the large-diameter well, and comparisons will show that in every instance the large-diameter well produces with a materially smaller gas-oil ratio than the small-diameter well. For example, in Figures 10, 11 and 12, the gas-oil ratios for the large-diameter well on the crest of the structure are respectively 0.056, 0.066 and 0.051 cubic feet per thousand cubic centimeters of oil. In Figures 13 and 14, parallel experiments in which gas flowing from a small-diameter well in the same position is measured, gas-oil ratios of 0.105 and 0.093 cubic feet per thousand cubic centimeters of oil are secured.

In the experiments referred to, and in others that have not been included in the foregoing discussion, small-diameter wells produced with an average gas-oil ratio of 0.106 cubic feet per thousand cubic centimeters whereas the gas-oil ratio for the large-diameter well averaged only 0.065. Since the efficiency of production is inversely proportional to the value of the gas-oil ratio, it is seen that the large-diameter well is 63 per cent. more efficient than the small-diameter well. The large well is even more efficient than these figures indicate, for in most of the experiments where gas volumes flowing from the large-diameter well were measured such measurments were started late, after the field pressure has been considerably diminished. The actual energy consumption for the large-diameter well was therefore less in comparison with the small-diameter wells than the gas-oil ratios would lead one to expect.

METHODS OF FORMING WELL CAVITIES WITHIN THE PRODUCTIVE OIL SAND

It is not the purpose of this paper to discuss in detail the methods that might be resorted to in practically realizing the advantages of large-diameter wells. These methods have been adequately described by the senior author in an earlier paper.[2] However, it would seem to be appropriate to briefly evaluate the possible methods that might be applied.

Any increase in well diameter within the reservoir sand would be advantageous, but reaming of a well of normal size to a diameter only a few inches greater would scarcely be sufficient to realize the full benefits possible by well enlargement. At any rate, a moderate increase of this character would not be comparable in its effect with the results that could be secured by the formation of cavities ranging from 10 to 20 feet or more in diameter. Theoretically a well one foot in diameter should have a rate of production 1.1 times that of a six-inch well, but a well 20 feet in diameter would have a production rate of upwards of 2.1 times that of the six-inch well.[3] The method of reaming the well should therefore contemplate the formation of cavities of considerable size.

Three methods of forming such cavities are possible. They might be formed with the aid of high explosives, a method widely used in well-cemented reservoir rocks in present day "well shooting" practice. This method, however, is necessarily imperfect in its application since the force of the explosion is largely expended in the formation of a shattered zone about the well, the crevices so formed being soon again filled with fine detrital material which offers great resistance to oil movement. Furthermore, it is difficult to control the effects of explosives or to gauge the results.

Mechanical types of under-reamers capable of operating through a well of normal size are scarcely practical in the formation of cavities of the proportions contemplated. Any rotating reaming device that might be conceived for such service would develop a prohibitive torsional strain and would be subjected to rapid wear in pulverizing or breaking down the many tons of material that must be removed to form such a cavity.

A third method, involving the use of a jet of oil directed against the oil sand under high pressure from an orifice in the side of the outer of two concentric strings of tubing extending down from the surface—a method suggested in a previous paper[4] by the senior author—would seem to offer the most practical means of forming a cavity of the desired proportions. In soft formations the well could be maintained full of oil and the detrital material formed by the jet circulated to the surface through the inner of two concentric tubes with the aid of several hundred pounds of pump pressure applied to the descending stream of oil. In harder formations the gas or air lift might be utilized to lift the spent fluid and detrital material to the surface by forcing compressed air or gas down through the space between the casing and tubing and using the inner of the two concentric tubes as an eduction tube. The ability of the gas or air lift to handle sand-oil mixtures under low submergence is well known. By this means the oil jet could be applied directly against the rock walls of the well under many hundreds of pounds of effective pressure. A terrific erosional effect could be thus developed, which should be effective in breaking down even the more resistant reservoir sands.

However formed, well cavities should be preserved and caving of the walls prevented by filling with gravel carefully sized so that it will serve as an effective screen for encroaching sand. Gravel of appropriate size offers a resistance to movement of but six-tenths of one per cent. that of the reservoir sand itself,[5]

[2]Uren, L. C., New Methods of Using Energy in Gas to Stimulate Oil Recovery, National Petroleum News, April 27, 1927, pp. 67-77.

[3]Uren, L. C., Op. cit. 1.

[4]Uren, L. C., Op. cit. 1.

[5]For data on the relative resistance offered to flow of liquids by different sizes of sand and gravel see a U. S. Geological Survey Water Supply Paper No. 140, by C. S. Slichter, entitled "Field Measurements of the Rate of Movement of Underground Waters," 1905.

so that after filling with gravel, the excavated space about the well is, for all practical purposes, still a cavity.

CONCLUSIONS

In interpreting the data of the experiments described in this paper the authors do not regard the results as quantitatively proportional to what might be expected in full-sized wells producing under the field conditions. The dimensions of the sand-filled pressure tank and the distances between the miniature wells are too small to permit direct comparisons; the pressures used were also comparatively low. It is believed, however, that qualitative data of a dependable character have been secured in these experiments which leave no room for doubt concerning the greater production efficiency of large-diameter wells.

The results prove conclusively that as the diameter of the well increases oil enters the well with less resistance and consequently with less expenditure of gas energy. This results in extending the drainage radius of the well, and in substantially increasing both its rate of production and its ultimate recovery.

It is also shown that under competitive conditions the producer who drills wells of larger diameter than his neighbors' enjoys an important advantage. One large-diameter well may offset two wells of normal diameter. Priority in completion of wells can be minimized and lost production regained providing the time handicap is not too great. Interference effects over wide areas may be developed. The superior production efficiency of the large-diameter well persists throughout its entire productive life. Although best results are secured by completing the wells originally with large diameters, even after properties have reached full development and have attained the "settled production" stage important increases in the ultimate recovery and rate of production may be realized by reaming cavities about the wells within the oil sand.

Where competitive conditions do not exist, it is believed that the large-diameter well offers important economic advantages in that it permits wider spacing of wells, more rapid recovery and greater ultimate recovery. This means lower development and production costs, quicker realization on invested capital, and greater ultimate profit. It would seem that the development of a practical method of reaming wells to large diameters where they penetrate the oil sand, and of preserving the cavities so formed, would offer a new and profitable field for investigation. The oil producer would thereby be given control of an important factor in oil drainage which he has hitherto disregarded; a factor which, when brought under control, offers the basis for an entirely new technic of far-reaching influence in the economics of oil production.

Handling Flowing Wells in the Mid-Continent Fields

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THE handling of natural flowing wells in a manner to make best use of the compressed gas which nature has stored with oil in an underground reservoir is of prime importance. Gas under natural reservoir pressure is a source of energy and expansion of this compressed gas is the major factor in determining the amount of oil that can be forced from the reservoir to a well. During the early life of a well when the oil and gas production from the reservoir is obtained from an area near the well and the reservoir pressure is relatively high, only part of the energy in the compressed gas is required for lateral movement of the fluids and the remainder may be utilized to lift the oil to the surface. The potential supply of energy in the form of compressed gas is limited and as oil bearing formations at progressively greater distances from the hole are drained, the amount of expansive energy required for lateral movement gradually increases. It is obvious that sooner or later there will be an inadequate supply of energy at the bottom of the well for lifting and the well will then stop flowing.

This paper has been prepared to emphasize the need for utilizing the original supply of natural gas energy at the bottom of the hole which is generally adequate to flow the average well in the Mid-Continent field a considerable length of time if it is made to do most effective work. Both the use of gas energy in recovery of oil from the reservoir rocks and in lifting are considered. The discussions apply primarily to conditions as they exist in the Mid-Continent fields of the United States.

FLOWING CONDITIONS IN THE MID-CONTINENT

In actual practice in Mid-Continent fields it is generally customary to allow a well to flow through the oil string so long as the decline in oil production is not too rapid. Frequently agitating or swabbing is resorted to as a means of retarding the rate of decline in oil production and of keeping a well flowing but sometimes a string of two-inch or 2½-inch tubing with a packer is run in wells that appear to have enough gas to flow naturally.

Usually formation gas-oil ratios of oil wells in the Mid-Continent district range from 1000 to 3000 cubic feet of gas per barrel and this volume of gas per barrel of oil under existing reservoir pressures is usually enough to flow the oil to the surface without any swabbing or agitating if the well is equipped with a flow string and handled in such a manner that the compressed gas energy is put to work.

From the viewpoint of energy consumption the depletion of the compressed gas in the reservoir goes on just the same whether the well is swabbing or flowing. In fact a swabbing well generally consumes more reservoir energy that a properly equipped flowing well because a greater volume of gas accompanies each barrel of oil.

In actual field practice it is customary to attempt to maintain a high rate of oil production by decreasing the back pressure on the producing sand. There comes a time in the life of a well when low back pressures are necessary, but for the most part a relatively high back pressure should be maintained as this will conserve the natural energy and result in a slower rate of decline of oil production.

If a well is made to flow its oil production with its own gas production, it is necessary to impose back pressure against the face of the producing sand. This back pressure will not be detrimental to the rate of oil production unless the reservoir has been appreciably depleted of its energy or unless nearby wells are allowed to flow with low back pressures. It is the writer's belief that an operator by properly equipping his well can even flow it when offset wells are swabbing or pumping provided he gives due consideration to the degree of energy depletion surrounding the well.

EXPANSION OF GAS IN FLOWING WELLS

On an average the volume of gas, measured under atmospheric conditions, produced with the oil in the Mid-Continent is from about 200 to 500 times the volume of oil. This gas-oil ratio considered on a volume basis, decreases progressively down the flow pipe according to the absolute pressure encountered. Also the decrease in the volume of

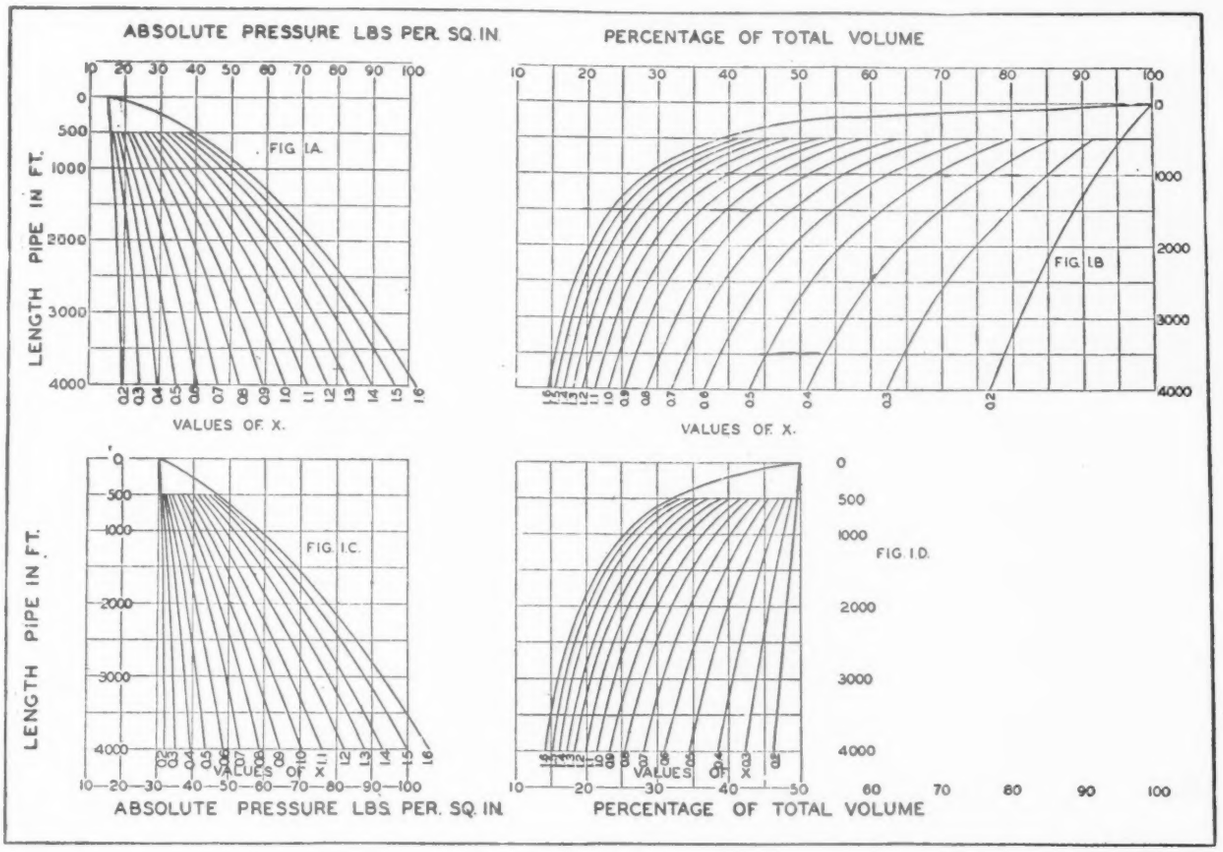

FIGURE 1

the expending gas causes a progressive decrease in the velocity of the flowing column of oil and gas. The lower part of the flow column is probably moved by an aerating effect of relatively dense and slow-moving gas bubbles in oil, while the upper part must be moved by a purely "velocity" flow of gas carrying drops of oil.

It is the expansion of compressed gas that does the work of lifting the oil to the surface but the rate of expansion per lineal foot of flow pipe has an important effect upon the velocity at which the drops of oil can travel through various sizes of flow pipes. There is a limit to the amount of gas which should be expanded through pipe of a given cross section if a maximum amount of oil is to be flowed from the well. This statement applies to that section of the flow pipe where so-called velocity lift predominates.

Data from a gas lift well in the Panhandle field are thought to substantiate some of the above observations. This well had 6⅝-inch casing and three-inch tubing. The end of the tubing was not restricted in any way and was about 80 feet 'off bottom.' The total depth of the hole was 3224 feet. Orifice meters were installed to measure the volume of gas injected into the well and the volume of gas discharged from the well. The well was flowed through the three-inch tubing due to the prevalent trouble with paraffin in that district and the frequent need for running paraffin scrapers. A gas trap was installed outside the derrick and all sharp turns in the flow line were eliminated. A pressure of 375 pounds per square inch was held at the casinghead for several hours before the well started flowing. After "cleaning the hole" the well flowed at the rate of 50 barrels per day with the pressure gauge on the casing registering 105 pounds per square inch; the volume of gas discharging from the well was in excess of 2,000,000 cubic feet per day. The pressure on the trap was 15 pounds per square inch. Decreasing the volume of gas injected into the well increased the pressure at the casinghead to 135 pounds per square inch. The gas discharged decreased to 800,000 cubic feet per day and the oil production increased to 600 barrels per day. The pressure on the trap under these conditions was only six pounds per square inch. Further changing of the volume of injected gas so that the discharged volume was 1,500,000 cubic feet per day, decreased the oil production to 425 barrels per day. The casinghead pressure during this test was 125 pounds and the trap presure eight pounds per square inch. The following tabulation summarizes results of these tests:

TABLE 1

Test No.	Casinghead Pressure Lb. p. sq. in. gauge	Trap Pressure Lb. p. sq in. gauge	Total Gas Production m. cu. ft. p. d.	Oil Production bbl. p. d.
1	105	15	2,000 +	50
2	135	6	800	600
3	125	8	1,500	425

From these data it obviously was not the back pressure against the face of the producing sand that decreased the amount of oil lifted to the surface when the larger volumes of gas were circulated, for the casinghead pressures were actually lower than when a smaller volume of gas was injected. Apparently, there was a critical velocity above which the drops of oil were unable to travel.

In handling natural flowing wells in the field, it has been observed that back pressures applied at the top of the flow pipe will often increase the rate of oil production. However, a measurement of the rate of gas production will generally disclose the fact that the critical velocity in the flow pipe had been exceeded before the back pressure was applied. Also it is frequently possible to increase the rate of oil production when a well is flowing through tubing by allowing some gas to escape through the casinghead. This is generally true where the critical velocity in the tubing has been exceeded.

In handling natural flowing wells the operation from an economical viewpoint, is desirous of causing them to flow as long as possible. It is also desirable to flow a well through one size of flow pipe as long as possible. If a flow string is run in a well with the idea of resulting in a velocity of the fluid column of near critical velocity, the well can produce a maximum length of time through the one

size of flow pipe before the minimum velocity of flow is reached. It is therefore important if possible to determine this critical velocity for various sizes of flow pipes.

GAS FORMULAE

Considerable data are available concerning the flow of gas through pipes, but very little is known regarding the flow of oil and gas mixtures. An inspection of graphical data based upon gas formulae helps clarify somewhat the pressure-volume-velocity changes in say, the last 1000 feet of flow pipe where the ratio of the volume of gas to the volume of oil is large, and therefore an oil and gas mixture should tend to approach the performance of gas only.

Weymouth's[1] formula for the flow of natural gas through pipe lines is as follows:

$$Q = 433.5 \left(\frac{T_o}{P_o}\right)\left[\frac{5280\, D^{8/3}\,(P_1^2 - P_2^2)}{G\ T\ L}\right]^{1/2}$$

where

Q = Flow per 24 hours—cubic feet.
D = Internal diameter of pipe—inches.
L = Length of line—feet.
G = Specific gravity of gas—(air = 1.0)
T_o = Absolute temperature base of the unit cubic feet—degrees Fahrenheit.
T = Absolute temperature of flowing gas-degrees Fahrenheit.
P_o = Absolute pressure base of the unit cubic feet—pounds per square inch.
P_1 = Absolute pressure at initial end of line—pounds per square inch.
P_2 = Absolute pressure at terminal end of line—pounds per square inch.

Assuming the following values the formula can be written:
G = 0.8 $T_o = (60° + 460°) = 520°$ Abs.
$T = (80° + 460°) = 540°$. $P_o = 15$.

$$P_1 = \sqrt{P_2^2 + L\left(\frac{Q}{52531 \cdot D^{2.66}}\right)^2}$$

$$P_1 = (P_2^2 + L\,x^2)^{1/2} \text{ where } x = \frac{Q}{52531 - D^{2.66}}$$

Note: The computations in this paper are of slide rule accuracy only.

A study of this formula discloses that the inlet pressure (P_1) is contingent on the discharge pressure (P_2) and the amount of pressure required to force a given quantity (Q) of gas through a certain size (D) and length (L) of pipe. If the discharge pressure (P_2) is assumed to remain constant and a variable X is substituted for the quantity $\frac{Q}{52531 \cdot 2.66}$ then the only other variable factor in the formula is the length (L) of pipe. The value of X represents a ratio contingent on the two variable factors, quantity (Q) of gas and size (D) of pipe. The substitution of P_2, L and X in the formula gives results for the inlet pressure (P_1) without establishing definite values for the quantity (Q) of gas and size (D) of pipe but a definite ratio dependent on the two factors is established. So, in a specific problem if the quantity (Q) of gas is known, the size (D) of pipe is also fixed and vice versa.

It is rather difficult to understand just how much effect each of the variables (P_2, L and ratio X) has on the inlet pressure (P_1) unless actual values are substituted for the variable factors and the results are graphically illustrated as in Figures 1A and 1C.

By substituting values ranging from 0.2 to 1.6 for the quantity X, with various values for L, and assuming an absolute pressure of 15 pounds per square inch for P_2, different values for P_1 are obtained as shown in Figure 1A. The data shown in Figure 1C were obtained by using the same values for X and L but assuming P_2 as 30 pounds per square inch absolute. Field observations on both natural flowing and gas lift wells indicate that the ratio between the quantity (Q) of gas required to flow the well and the size (D) of flow pipe is quite important and that this ratio has maximum and minimum limits if the compressed gas is to do the work of lifting the oil to the surface. The ratios for X ranging from 1.6 to 0.2 probably include these maximum and minimum limits if the well is flowing against approximately atmospheric pressure. In practice the correct ratio is obtained in a natural flowing well by running a certain size (D) of flow pipe to suit the quantity (Q) of gas or in a gas lift well by injecting a sufficient quantity (Q) of gas to suit the size (D) of flow pipe that has been run.

Boyle's law provides the following equation for a perfect gas expanding under conditions of constant temperature. The assumption is made, for the problem under discussion, that natural gas while expanding obeys Boyle's law.

$P_2\ Q_2 = P_1\ Q_1 = \text{Constant}$.

P_2 and Q_2 = Terminal pressure and volume of gas.

P_1 and Q_1 = Any other pressure and volume of gas.

By substituting 15 as the terminal pressure for P_2 and 100% as the terminal volume for Q_2 and the absolute pressures for P_1 corresponding to the proper values of L and X as shown in Figure 1A, different percentages of Q are obtained as shown in Figure 1B. The data shown in Figure 1D were obtained by substituting 15 as the initial pressure for P and 100% as the initial volume for Q but using the absolute pressure for P_1 corresponding to the proper values of L and X as shown in Figure 1C to arrive at different percentages of Q as shown in Figure 1D. In other words, 15 pounds per square inch of back pressure (gauge) exists at the terminal end of the pipe.

The graphical illustrations of Figure 1 are helpful in analyzing the changes of pressure and volume due to the expansion of compressed gas through pipe lines. As shown in Figures 1A and 1C, back pressure applied at the discharge end of a pipe line has a more pronounced effect on the inlet pressure for the smaller values of X. The proportionate changes in volume on account of this condition are emphasized in Figures 1B and 1D. The conclusion to be drawn, when considering the energy of compressed gas as the means of lifting oil through that part of the flow pipe where "velocity lift" predominates, is that the quantity $X = \frac{Q}{52531 \cdot 2.66}$ must increase as the applied back pressure increases if the same amount of energy is required to lift the oil to the point where back pressure is applied. In other words, there is a limit to the amount of back pressure that should be applied to a certain diameter of flow string. When additional back pressure is desired, a flow pipe of smaller diameter should be used if "velocity lift" is to be maintained. In practice we find this condition illustrated in a well that will not flow through 6⅝-inch casing but will flow through 5-3/16-inch casing. The well will flow against atmospheric pressure through the smaller size of flow pipe but not through the larger size.

Figures 2A and 2C correspond to Figures 1D and 1B, respectively, except that Q is taken at 1,000,000 cubic feet of gas per day instead of on a percentage basis. By fixing a value for Q and using the inside diameters of commercial sizes of pipe for D, most of the curves representing the values of X are eliminated and the problem of choosing maximum and minimum values of X is much simpler.

Figures 2B and 2D apparently do offer some evidence as to maximum and minimum values of X by illustrating the velocity of the gas through different sizes of flow pipes. These curves were obtained by the use of the basic formula, quantity = area times velocity ($Q = Av$). The velocities indicated in Figures 2B and 2D are fixed by the values of Q and diameters of pipes as given in Figures 2A and 2C, respectively. The curved lines marked 500 feet—1000 feet—2000 feet, etc., show the velocities of the expanding gas at the corresponding depth in the hole according to the diameter of the pipe. The velocities at the top of the hole are shown by a vertical line.

The velocities for depths below 1000 feet in Figure 2D would be progressively lower depending upon depth if the pipe carried oil and gas instead of gas only. But with the volume of gas near the top of the well something like 200 to 500 times the volume of oil, it is apparent that the veloci-

[1]Transactions of the American Society of Mechanical Engineers, Vol. 34, pp. 1091-1094.

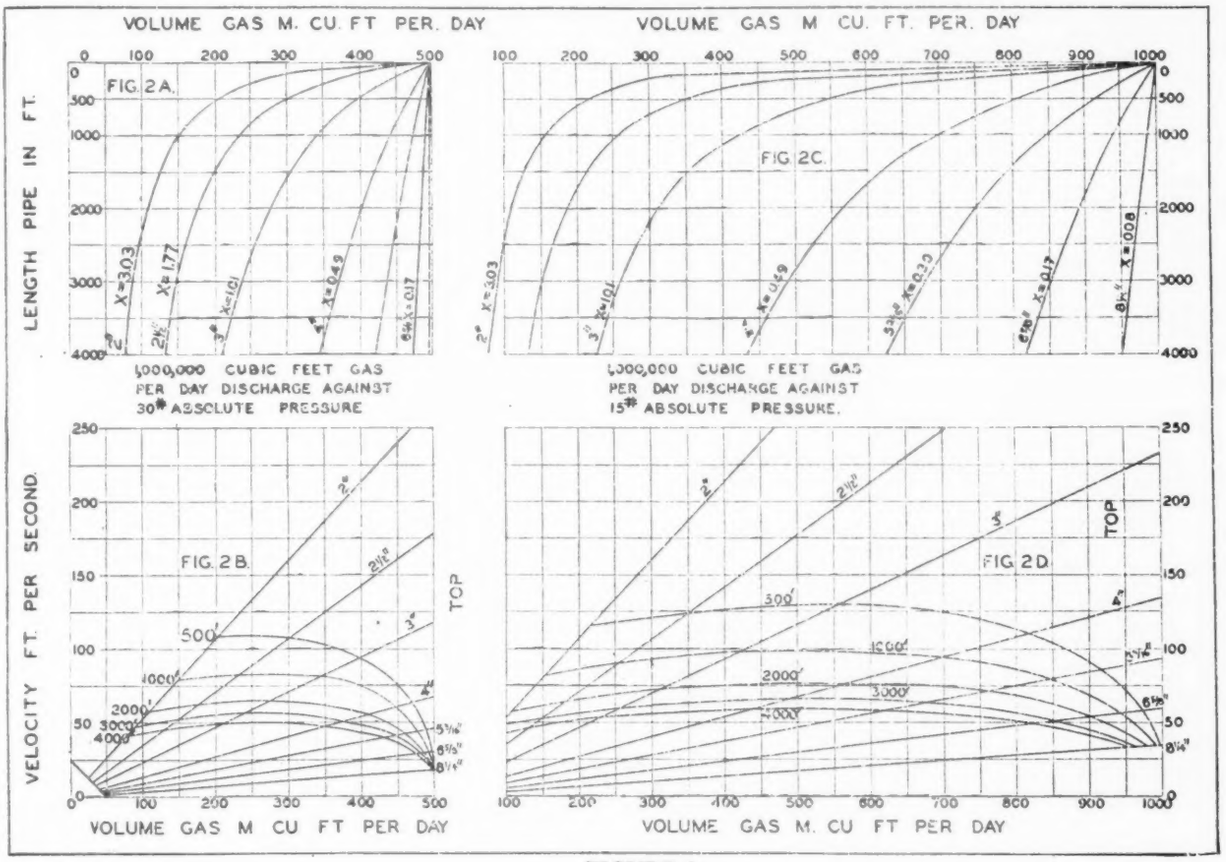
VOLUME GAS M. CU. FT PER. DAY
FIG. 2A.
LENGTH PIPE IN FT.
1,000,000 CUBIC FEET GAS PER DAY DISCHARGE AGAINST 30# ABSOLUTE PRESSURE
VOLUME GAS M CU. FT. PER. DAY
FIG. 2C.
1,000,000 CUBIC FEET GAS PER DAY DISCHARGE AGAINST 15# ABSOLUTE PRESSURE.
VELOCITY FT. PER SECOND
FIG. 2B.
TOP
VOLUME GAS M CU FT PER DAY
FIG. 2D.
VOLUME GAS M. CU FT PER DAY

FIGURE 2

ties above 1000 feet should approach those for gas only. Figure 2D should help to indicate a maximum value of X. For, it will be noted in Figure 2D and also in Table 3, that the velocity at a depth of 500 feet is higher through 3 inch pipe than through any other size. This is also true at a depth of 1000 feet. The velocities corresponding to these depths are lower through 2 inch and 2½ inch pipe but the increase in velocity from 500 feet to the top is much greater than through 3 inch. Figure 2C shows that the value of X for 3 inch is 1.01.

The graphs in Figure 3 are similar to those in Figure 2 except that 3,400,000 cubic feet of gas per day are used for the value Q. In this case the maximum velocity at depths of 500 feet and 1000 feet is obtained through 5-3/16 inch casing. As shown in Figure 3C the value of X in a 5 3/16 inch flow string is also 1.01. Likewise, similar for other volumes of gas would show a maximum velocity, compared with a minimum velocity at the top, for depths of 500 feet and 1000 feet for the size of pipe where $X = 1$.

Table 2 gives the volumes of gas in cubic feet per day discharged at 15 pounds per square inch absolute with the corresponding sizes of commercial pipe to fit the equation

$$X = \frac{Q}{52531 d^{2.66}} = 1.$$

TABLE 2

Diameter Pipe Inches	Weight Pipe Lb. p. ft.	Volume of Gas M. cu. ft p. d. 15 lb. p. sq. in. abs.
2	4.6	330
2½	6.4	564
3	8.5	992
4	12.6	2,040
5-3/16	20	3,367
6⅝	24	5,957
8¼	32	12,917

The graphical illustrations in Figure 4 show the velocities at different depths down the hole of the volumes of gas for the sizes of pipe as shown in Table 2. As an example, 3,367,000 cubic feet of gas per day under an absolute pressure of 15 pounds per square inch has a velocity through 5-3/16-inch casing of 313 feet per second. At 500 feet down the hole this gas is under an absolute pressure of 26.9 pounds per square inch, its compressed volume is 1,880,000 cubic feet per day and the velocity through 5-3/16-inch casing is 175 feet per second at this point. At a depth of 1000 feet, the absolute pressure is 35 pounds per square inch, the compressed volume is 1,445,000 cubic feet per day and the velocity is 134 feet per second.

It will be noted that the pressure at a designated depth is the same for all sizes of pipe. Therefore, the pressure drop is the same for all sizes of pipe where $X = \frac{Q}{52531 d^{2.66}} = 1$, but the volume and velocity of the gas increases with the size of the pipe.

The maximum volume of gas that should be expanded to 15 pounds per square inch absolute through a given size of pipe to obtain a maximum velocity of the gas at depths of 500 and 1000 feet compared with a minimum velocity at the top of the well is given in Table 2. If this amount of gas is expanded through smaller sizes of pipe the velocity at depths of 500 and 1000 feet will decrease because the absolute pressure due to frictional losses must increase at the designated depths. As an illustration, Table 3 has been prepared to show the velocity and pressure at different depths accompanying the expansion of 1,000,000 cubic feet of gas per day through 2-inch, 2½-inch and 3-inch tubing.

TABLE 3

Diameter of Pipe Inches	Volume gas M. Cu. Ft. P. D.			Velocity gas Ft. P. Sec.			Absolute Pressure Lb. P. Sq. In.		
	Top	500 ft	1000 ft	Top	500 ft	1000 ft	Top	500 ft	1000 ft
2	1,000	216	155	533	115	83	15	70	97
2½	1,000	354	258	356	126	92	15	42	58
3	1,000	554	421	233	129	98	15	27	36

TURBULENCE AND CRITICAL VELOCITY

A study of the data in Table 3 discloses some information that may be of value in attempting to fix a critical

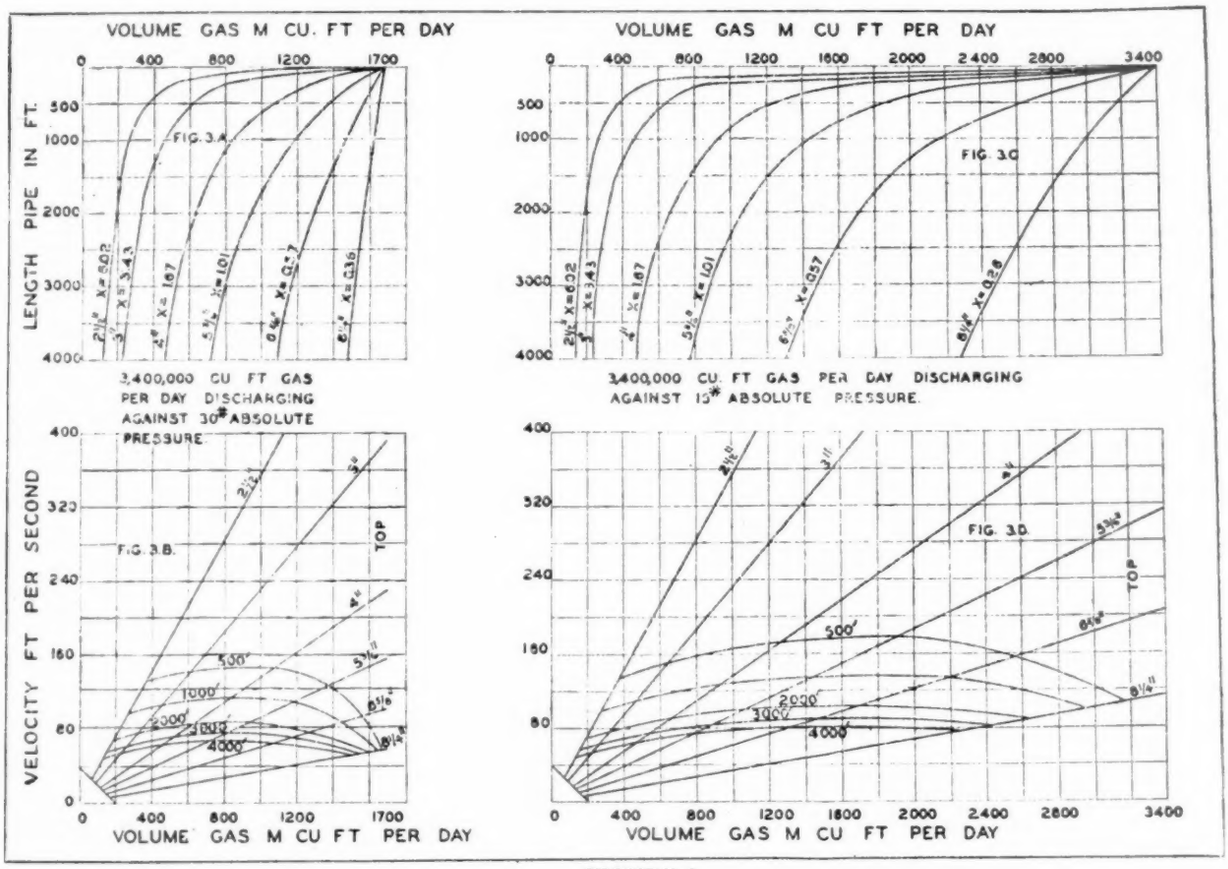
VOLUME GAS M CU. FT PER DAY
LENGTH PIPE IN FT.
FIG. 3.A.
3,400,000 CU FT GAS PER DAY DISCHARGING AGAINST 30# ABSOLUTE PRESSURE
VELOCITY FT PER SECOND
FIG. 3.B.
VOLUME GAS M CU FT PER DAY
FIG. 3.C
3,400,000 CU. FT GAS PER DAY DISCHARGING AGAINST 15# ABSOLUTE PRESSURE.
FIG. 3.D.
TOP

FIGURE 3

velocity for oil and gas mixtures in a flow pipe. The pressure drop for 1,000,000 cubic feet of gas per day passing through 1000 feet of two-inch pipe is 82 pounds per square inch, through a 2½-inch flow string it is 43 pounds per square inch, and through a three-inch it is 21 pounds per square inch. As the pressure at the end of the pipe is 15 pounds per square inch absolute in each case and the discharged volume of gas is constant, it seems logical to assume that a greater degree of turbulence must be the major factor to be considered in accounting for the additional loss of energy through the smaller sizes of pipe.

If the conclusion is correct that excessive turbulence does exist under these conditions, it seems obvious in the case of oil and gas mixtures, that the drops of oil tending to follow an eddying or swirling motion would sooner or later come into contact with the metal surface of the pipe where they would tend to adhere. The result would probably be a cylindrical oil film formed on the inner surface of the pipe, as "velocity lift" predominates in the upper section of a flow string, it seems logical to assume that the gas by-passes the oil and proceeds through a lubricated cylinder.

Velocity furnishes an indication of the degree of turbulence. The term critical velocity as used in this paper refers to the velocity at which turbulence interferes with the "velocity lift" or drops of oil and should not be confused with the term critical velocity as ordinarily used where "viscous flow" supercedes "turbulent flow." The writer has had occasion to check in the field, within practical limits, the volumes of gas as shown in Table 2 as the maximum amount of gas which should be expanded through the given size of flow pipe against atmospheric pressure on the trap if the maximum rate of oil production is maintained. The check has only been approximate due to varying physical and chemical characteristics of both the oil and gas from different wells. Gas measurements in most cases have been corrected for assumed values of specific gravity and temperature, and in some cases made with a Pitot tube instead of orifice meters. Pressure gauges on traps have not been checked. The wells varied in depths from 2500 to 4500 feet. Rock pressures have been relatively low and gas-oil ratios have ranged from 1000 to 3000 cubic feet per barrel.

An approximation of the maximum volume of gas which should be produced through a given size of flow pipe to lift the oil is of considerable value in handling flowing wells. The gas measurement of a well limits the selection of the proposed flow string to two sizes. One size will be above the critical range and the other below.

BACK PRESSURE AND CRITICAL VELOCITY

The critical velocity in the upper part of the flow string can also be controlled by applying back pressure at the discharge end of the pipe. As commercial sizes of tubing and casing limit the value of X for a given gas measurement (Q), the problem is to select a flow string which fits the conditions for the particular well and its estimated performance. If the critical velocity is exceeded, a small amount of pressure on the trap will reduce the expansion of the gas and thus decrease the velocity in the flow string without materially affecting the back pressure against the oil sand.

The back pressure on a trap can be increased to increase the inlet pressure on the flow string and thereby the back pressure on the oil sand. In this case it is minimum velocity that should be guarded against, because there is a limit to the amount of back pressure that should be applied to the discharge end of a given size of flow string with a certain volume of gas because the pressure at the bottom of the well is fixed. Excessive back pressure reduces the velocity of the expanding gas to the extent that the gas-lift efficiency is impaired.

The writer has included in Figures 1, 2 and 3 a set of graphs illustrating the effects of 15 pounds per square inch of back pressure (gauge) applied at the end of a pipe line

discharging gas. Their values for oil and gas mixtures is problematical. The density of the high pressure gas is nearer that of the oil than of gas at low pressure and undoubtedly this physical characteristic has an effect upon the gas as a lifting medium. The graphs do indicate, when compared to the corresponding ones for atmospheric discharge, that a comparatively small amount of back pressure has a decided effect upon the volume and velocity characteristics of the expanding gas, especially near the discharge end of the pipe.

LOCATION OF THE GAS TRAP

The location of the gas trap has a decided effect upon the length of time a natural flowing well will flow its production. Each well to be flowed should have a separate gas trap, for the cost of installation and depreciation is negligible compared to the benefits to be derived.

The fundtion of compressed gas as a lifting medium does not cease when the oil is brought to the top of the flow string as it must also force the oil through the lead or flow line to the gas trap. Thus the pipe and connections from the top of the well to the gas trap are really part of the flow pipe. It takes pressure on the expanding gas to force the oil and gas mixture through the surface piping and the amount of pressure is partially fixed by the size, length, and number of turns in the piping. This pressure is transmitted to the bottom of the well and therefore against the reservoir pressure. As the reservoir pressure diminishes and the energy neecssary for lateral movement of the oil and gas increases, it is certain that sooner or later the pressure at the bottom of the well will be inadequate to flow the oil unless the back pressure at the top of the well can be decreased.

Obviously the number of turns in the surface lines should be a minimum and the trap should be located as close to the top of the flow string as possible. When the flow string is first run it may be desirable to carry considerable pressure at the top of the well but this pressure should be carried on the trap where it can easily be reduced at the option of the operator.

The elevation of the gas trap should be sufficient to allow the oil to flow by gravity to the stock tanks. At the top of the flow string the oil and gas mixture is already traveling in a vertical direction and a few feet added to the vertical height of the flow pipe adds only a small amount of back pressure on the flowing mixture compared to the amount necessary to carry on the trap and force the oil into the tanks where the top of the stock tank is higher than the oil valve on the trap.

WHEN TO RUN THE FLOW STRING

The flow string should be run as soon as a well is completed, shot, and ready to produce. After measuring the gas volume and estimating its flush decline, a flow string should be selected which approaches the critical velocity for the given gas volume. If additional back pressure is desired, a smaller size of flow pipe should be run. A well preferably should not be allowed to produce through the oil string unless the oil string happens to fit the conditions for a flow string. Running the flow string as soon as possible does not in general increase the oil production, but it does cause a higher amount of back pressure against the face of the producing sand than if the well flowed through the larger oil string.

If a well is allowed to produce through the oil string until the rate of oil production materially decreases, and it possibly shows signs of "dying," the probabilities are that a smaller oil string will temporarily reduce the daily oil production until the pressure conditions at the bottom of the well are adjusted to the changed condition of higher back pressure. It is usually the conclusion that the flow string should have been run sooner, for experience in the Mid-Continent fields teaches that increasing back pressure at a delayed date does not seem to have the desired effects.

PRACTICAL FIELD SUGGESTIONS FOR FLOWING WELLS

It is desirable to install a trap at a well before the well is completed if experience with nearby wells indicates that the well will produce with a fair amount of gas. The oil string should be connected to the trap so that it can be used before the flow string is run.

An orifice meter installed on the gas discharge line from the trap is well worth its cost. It gives a correct measurement of the amount of gas the well makes prior to its completion and a study of the meter charts should be the main factor influencing the decision on the size of flow string which should be run in the well. After a flow string is run the measurement of gas volumes furnishes information so neccssary to handle a flowing well intelligently.

It is the opinion of the writer that in Mid-Continent wells the end of the flow string should be hung at approximately the top of the producing sand and that nothing should be put on the end of the pipe except a thread protector.

It may be advantageous on some wells producing very small volumes of gas and oil to run a packer on the flow string, but in the majority of cases a packer is unnecessary and most times it is not desirable. Packing the well at the control head permits the use of a pressure gauge, preferably a recording one, to indicate the inlet pressure at the bottom of the flow string and likewise the approximate back pressure at the oil sand. Also, if the flow string is too small at first and back pressure is not desirable at the bottom of the well, part of the gas and even some of the oil that would otherwise be forced up the flow string, can be produced through the annular space between the flow string and the casing. A further practical advantage in running tubing without a packer is that a well can continue to flow between the casing and tubing while the tubing is being run. A disc placed in the flow string will prevent oil from spraying into the derrick. By using a disc and one of the tubing or casing oil-savers on the market, there is very little waste of oil and the workmen are safer and do better work.

The practice of dropping a weight to break the disc in the flow string is not recommended. The weight should be attached to the sand line. By the latter method the weight can break the disc and then be run on through the pipe to insure that no part of the disc remains in the flow pipe to restrict the flow of oil and gas. One disadvantage to the practice of running a weight on the sand line, is the danger, in wells where the pressure below the disc might be sufficiently great enough to blow the weight up the flow string and "kink" the sand line.

The flow string should be of uniform size throughout its length unless there is a source of high pressure gas or air available to "kick off" the well in case it refused to flow after the casinghead is closed. A uniform flow string permits swabbing to start the well flowing. This may be very important for it is often necessary to swab a well for a considerable length of time before it will continue to flow. One well known to the writer required two days of swabbing to start it flowing although it continued to flow for six months without interruption.

CONCLUSION

This paper has attempted to point out the opportunities to Mid-Continent operators in producing many wells economically during the flush stage by taking advantage of the expansion of the compressed gas, which Nature has stored with oil, and using some of this expansive energy in flowing.

In the Mid-Continent, the volume of the gas under reservoir pressure, is several times the volume of the oil with which it associates. The winding minute channels in the sand afford a limited passageway for the movement of oil and gas mixtures and there is nothing to be gained by in-

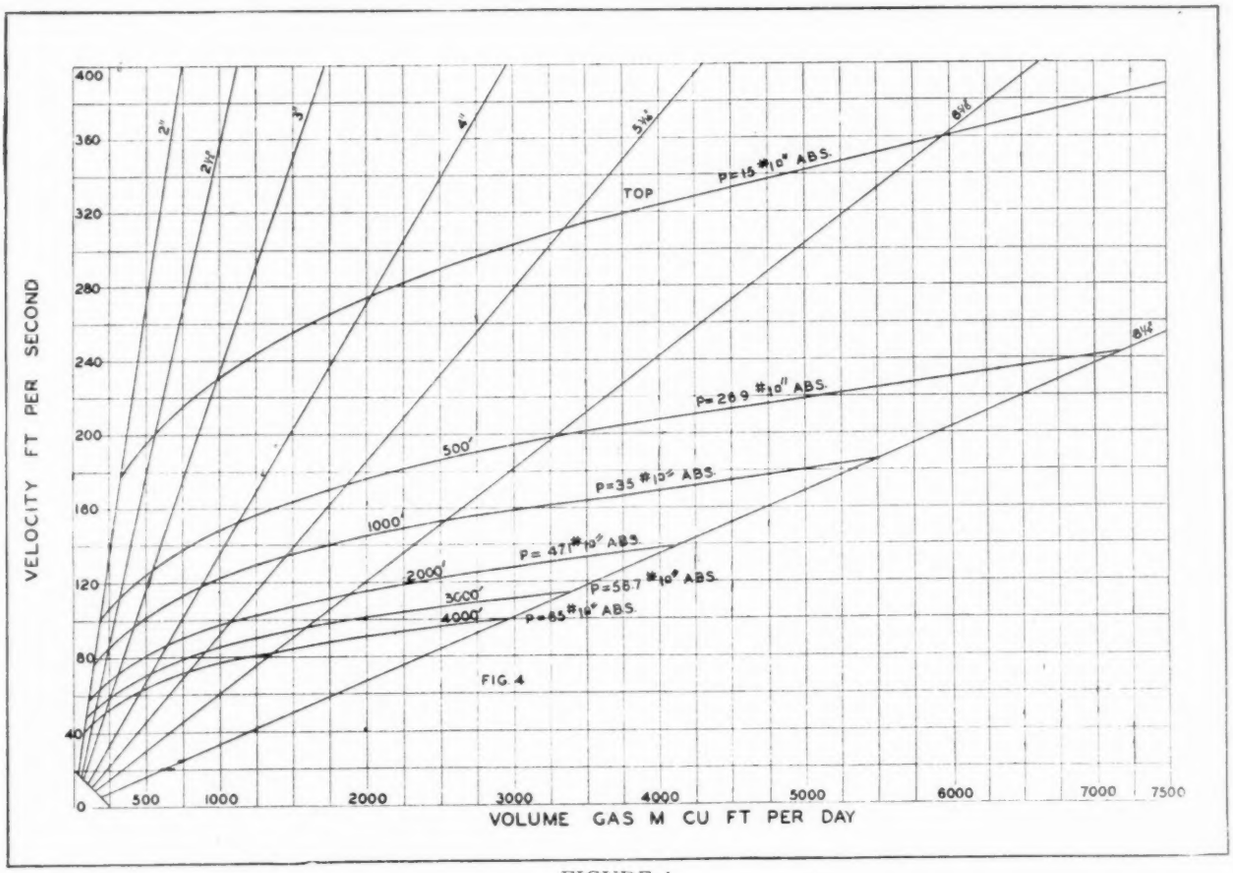

FIGURE 4

creasing, through expansion, the volume of the gas as it proceeds through the winding channels unless more energy is needed for moving the mixture. If more energy is needed it can be secured by reducing the back pressure against the face of the sand.

Oil is a liquid and cannot travel as rapidly through the minute, winding channels in oil sands as can gas, and for that reason the velocity of the expanding gas must be controlled to suit the maximum velocity for the oil and this control is secured by applying back pressure at the bottom of the well.

The amount of back pressure that should be imposed against the face of the producing sand during the flush stage of production is problematical but regardless of what this maximum back pressure should be, the operator can at least feel justified for a certain length of time in holding the amount of pressure at the bottom of the well that is necessary to flow the production to the surface. If the well is properly swabbed or agitated, the oil production will compare favorably with the amount that can be produced if the well is properly equipped to flow, but in the former case the gas does most of its expansion through the winding channels in the sand where its full expansion is unnecessary unless the reservoir pressure is relatively low. Therefore the cost of swabbing or agitating can be eliminated if a certain amount of pressure is maintained at the bottom of the well so that part of the expansion of the gas can occur in the flow pipe.

The rate of expansion of the compressed gas per lineal foot of flow pipe is quite important and this rate of expansion can be controlled by running the proper size of flow pipe or by applying back pressure at the top of the well.

The writer feels that the discussions and data offered in this paper justify the statement that there is a maximum rate of gas flow through a given size of flow pipe against atmospheric pressure if all the oil entering the well is flowed to the surface and if a relative low pressure is maintained to flow the well. Therefore, if the rate of expansion of the gas is to be controlled by restricting the flow to a certain size of pipe, a measurement should be made of the volume of gas which the well produces and a suitable size of flow string selected to fit the above conditions. The volumes of gas as given in Table 2 are suggested as the approximate maximum volumes of gas which should be expanded through the given sizes of pipe against atmospheric pressure to lift all the oil that can enter the well with a relatively low back pressure on the sand. It is assumed that the gas-oil ratio will be more than 1000 cubic feet of gas per barrel of oil.

If back pressure is applied at the top of the well to control the expansion of the gas up the flow string there will be a higher back pressure against the face of the producing sand than would be the case if the expansion were controlled by running the proper size of flow pipe. If back pressure is applied at the top of a given size of flow pipe for the purpose of increasing the back pressure on the sand, then the problem is to ascertain by trial how much back pressure can be applied before the minimum rate of expansion occurs in the flow pipe and the rate of oil production decreases.

As the reservoir pressure gradually decreases, with the age of the well and field, more of the expanding gas is required to force the oil into the well and consequently less pressure is available to expand the gas up the flow pipe. If the well is to continue to flow its production all unnecessary back pressure at the top must be eliminated.

The writer believes that a better understanding of the factors affecting the life of the type of flowing wells found in the Mid-Continent will influence the operators in that district to produce their "flush" oil more economically and to increase the ultimate yield of the wells by studying the effects of back pressure applied against the face of the producing sand.

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Summary of Field Operations for November 1928

EASTERN STATES

PENNSYLVANIA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod.
Bradford	205	201	..	4	661
Clarion	19	7	8	4	16
Greene	13	2	11	..	57
Venango	33	28	4	1	66
Center-Middle	16	14	1	1	56
Butler	20	14	2	4	47
Washington	4	..	2	2	...
Beaver	2	1	..	1	1
Allegheny	2	..	2	..	...
Total	314	267	30	17	904

INDIANA

Adams	1	1	..	..	5
Gibson	1	..	..	1	...
Pike	1	..	..	1	...
Harrison	2	..	2	..	...
Madison	2	..	1	1	...
Total	7	1	3	3	5

WEST VIRGINIA

Calhoun	14	4	9	1	13
Ritchie	9	4	5	..	19
Wirt	3	2	1	..	4
Lincoln	7	..	7	..	...
Roane	5	..	2	3	...
Doddridge	2	1	1	..	10
Boone	9	..	9	..	...
Lewis	6	..	5	1	...
Tyler	3	..	3	..	...
Gilmer	6	2	3	1	44
Wayne	3	1	2	..	4
Wood	1	..	..	1	...
Kanawha	3	1	2	..	3
Wetzel	5	1	3	1	2
Harrison	3	..	2	1	...
Tyler	1	..	1	..	...
Marion	2	..	2	..	...
Clay	1	..	1	..	...
Logan	1	..	1	..	...
Pleasants	1	..	1	..	...
Marshall	2	..	..	2	...
Cabell	1	..	..	1	...
Total	88	16	60	12	99

ILLINOIS

Crawford	13	5	3	5	80
Wabash	3	2	..	1	175
Lawrence	2	1	..	1	25
St. Clair	1	..	..	1	...
Total	19	8	3	8	280

TENNESSEE

Clay	3	3	..	..	390

NEW YORK

Allegany	55	51	1	3	186

MICHIGAN

Muskegon	19	13	6	..	7,120

KENTUCKY

Ohio	50	31	5	4	1,313
Daviess	36	27	1	8	1,110
Warren	4	4	..	..	10
Hancock	1	..	..	1	...
Allen	7	3	..	4	9
Webster	1	1	..	..	25
Simpson	1	1	..	..	2
Hopkins	1	1	..	..	20
Wayne	2	1	..	1	10
Powell	2	2	..	..	8
Floyd-Knott	2	1	1	..	50
Wolfe	1	1	..	..	6
Johnson-Magoffin	2	1	..	1	25
Estill	7	5	..	2	7
Breathitt	1	..	..	1	...
Barren	24	19	..	5	122
Hardin	1	..	..	1	...
Morgan	1	1	..	..	15
Owsley	1	..	1	..	...
Total	145	99	8	38	2,732

RECAPITULATION: ENTIRE U. S.

Section—	Completions	Producers	Gas Wells	Failures	Initial Prod.	Prod. for Month
Oklahoma	279	161	26	92	65,569	21,472,000
Kansas	91	39	8	44	5,095	2,897,350
Texas (Outside Gulf Coast)	559	296	42	221	228,566	17,590,200
Gulf Coast	112	52	1	59	25,700	4,052,800
N. Louisiana	39	4	11	24	513	1,158,100
Arkansas	37	12	10	15	956	2,490,050
Eastern States	895	546	208	141	13,574	3,291,500
Rocky Mountain	...	...	...	...	....	2,434,400
California	70	68	...	2	98,255	19,591,900
United States Total	2,082	1,178	306	598	438,228	74,978,300

OHIO

SOUTHEASTERN—

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod.
Washington	14	4	7	3	32
Morgan	20	2	18	..	4
Noble	5	4	1	..	24
Monroe	15	7	3	5	28
Harrison	1	..	1	..	...

NORTHWESTERN—

Allen	4	4	..	..	95
Wood	5	5	..	..	41
Hardin	1	..	1	..	...
Seneca	7	2	1	4	225
Auglaize	3	2	..	1	27
Mercer	3	2	1	..	25
Ottawa	1	..	1	..	...
Shelby	1	..	..	1	...

CENTRAL—

Athens	23	5	15	3	21
Holmes	7	2	4	1	77
Licking	21	13	2	6	187
Ashland	23	6	9	8	57
Meigs	11	5	2	4	10
Jackson	4	..	3	1	...
Hocking	5	3	2	..	67
Knox	9	..	7	2	...
Coshocton	5	1	3	1	114
Perry	5	3	2	..	190
Cuyahoga	10	6	1	3	410
Vinton	2	1	..	1	10
Muskingum	2	1	..	1	4
Lorain	5	1	3	1	130
Wayne	1	..	1	..	...
Carroll	5	..	2	3	...
Medina	2	1	..	1	7
Gallia	9	3	2	4	22
Guernsey	2	..	2	..	...
Stark	9	4	3	2	46
Tuscarawas	2	..	..	2	...
Columbia	1	..	..	1	...
Fairfield	1	..	..	1	...
	1	1	..	..	5
Total	245	88	97	60	1,858

Production in November ..... Barrels 3,291,500

MOUNTAIN STATES

WYOMING

Field—	Nov. Prod.
Salt Creek	1,084,500
Grass Creek	70,500
Elk Basin	28,100
Big Muddy	78,900
Lost Soldier	108,150
Rock Creek	76,700
Lance Creek	10,500
Oregon Basin	136,200
Others	179,750
Total	1,776,300

MONTANA

Cat Creek	45,500
Sunburst	243,850
Pondera	56,000
Others	7,250
Total	353,200

COLORADO

Moffats	36,650
Fort Collins	70,950
Florence	37,350
Others	73,250
Total	218,200

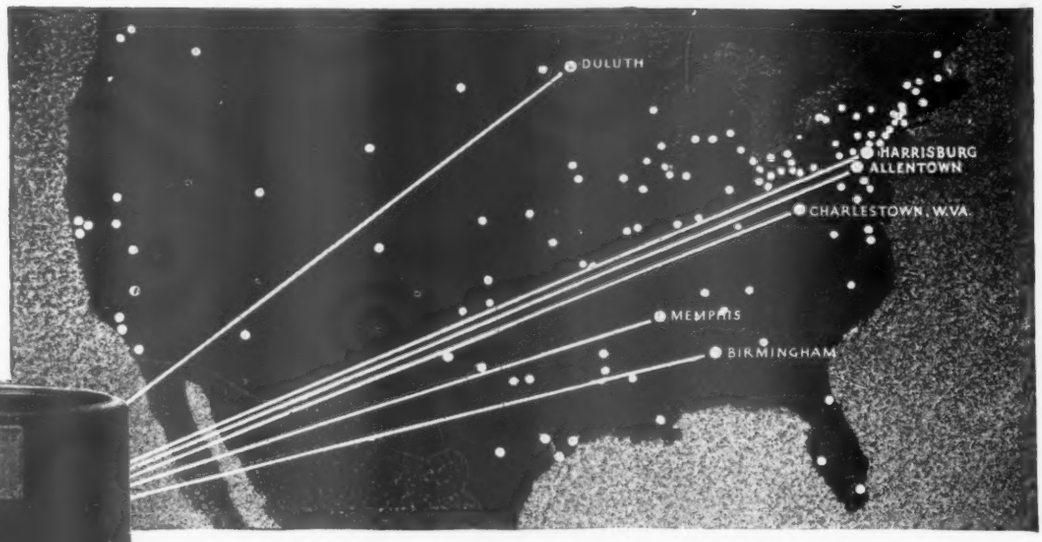
NEW MEXICO

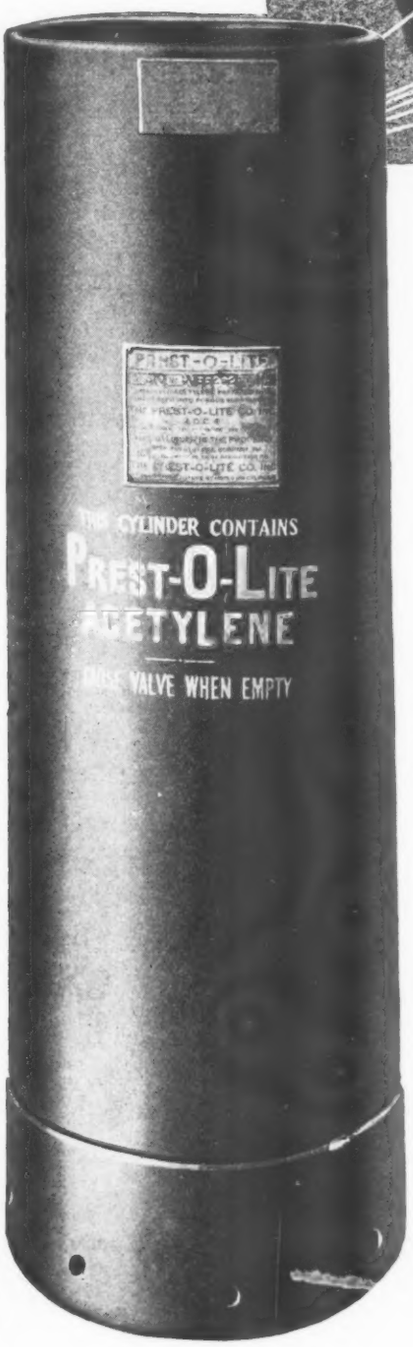
Table Mesa	2,450
Artesia	31,200
Hogback	15,150
Rattlesnake	31,200
Others	5,600
Total	86,700

OKLAHOMA

OKLAHOMA PRODUCTION SUMMARY

North Braman	81,700
South Braman	40,400
Blackwell	94,950
Hubbard	71,000
Thomas	32,650
Tonkawa	354,850
Garber	215,300
Burbank	770,800
Osage	782,900
Cushing	602,900
Vale	228,350
Davenport	51,200
Bristow	612,250
North Okmulgee	433,000
Lyons-Deaner	132,750
Cromwell	258,150
Papoose	120,000
Wewoka	162,150
Seminole	1,267,100
Bowlegs	1,501,250
Searight	316,900
Little River	3,281,700
Earlsboro	2,306,500
Duncan	230,150
Graham	141,400
Fox	48,000
Healdton	411,450
Hewitt	271,000
Scholem-Alchem	429,600
Pearson	61,100
St. Louis	3,855,500
Allen	713,650
Others	1,591,550
Total	21,472,000





Six new reasons for buying

Prest-O-Lite

DISSOLVED ACETYLENE

THE FACT that Prest-O-Lite could be readily obtained direct from plants or warehouses in most of the industrial centers of the country has been one reason for its tremendous success.

But the nation-wide demand has been steadily growing. To keep pace with this increased business, six new manufacturing plants have been placed in operation during the past year.

And now, with a total of 35 plants and 100 warehouses, Prest-O-Lite is equipped to render industry even greater service.

THE PREST-O-LITE COMPANY, INC.

Unit of Union Carbide UCC *and Carbon Corporation*

GENERAL OFFICES: Carbide and Carbon Building
30 East 42d Street, New York

KANSAS PRODUCTION SUMMARY

Greenwood	764,300
Florence	27,400
Peabody	97,500
El Dorado	387,500
Augusta-Fox Bush	106,850
Rainbow Bend	40,700
Russell	120,650
Churchill	246,400
Oxford	227,650
Others	888,300
Total	2,897,350

KANSAS

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod
Barber	1	..	1	..	...
Butler	18	12	..	6	2,090
Clark	1	..	1	..	...
Coffee	1	..	1	..	...
Cowley	10	4	..	6	105
Elk	16	10	1	5	1,535
Greenwood	15	4	1	10	395
Jackson	1	..	..	1	...
Lyon	1	..	..	1	...
Marion	5	3	..	2	250
McPherson	3	..	2	1	...
Morris	1	..	1	..	...
Riley	1	..	..	1	...
Rooks	4	1	..	3	35
Russell	4	2	..	2	400
Seward	1	..	..	1	...
Sumner	5	3	..	2	285
Wilson	1	..	..	1	...
Woodson	2	..	..	2	...
Total	91	39	8	44	5,095

CALIFORNIA PRODUCTION SUMMARY

Field—	Barrels
Santa Fe Springs	1,699,500
Long Beach	5,691,500
Huntington Beach	1,539,000
Torrance	480,000
Dominguez	300,000
Rosecrans	162,500
Inglewood	838,800
Midway-Sunset	2,240,000
Ventura	1,558,000
Seal Beach	786,500
Others	4,286,100
Total	19,591,900

ARKANSAS PRODUCTION SUMMARY

Field—	Barrels
El Dorado	151,350
Champagnolle	374,650
Smackover Light	215,850
Smackover Heavy	1,622,450
Stephens	30,150
Nevada	42,000
Lisbon	51,500
Others	3,000
Total	2,490,050

CALIFORNIA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod
Athens-Rosecrans	3	3	..	..	1,200
Belridge	1	1	..	..	50
Elwood	2	2	..	..	9,800
Fruitvale	1	1	..	..	2,600
Huntington Beach	2	2	..	..	165
Kettleman Hills	1	1	..	..	4,500
Long Beach	36	36	..	..	29,200
Kern Front	1	1	..	..	300
Midway-Sunset	4	4	..	..	3,840
Mount Poso	3	3	..	..	1,100
Richfield	2	2	..	..	1,300
Santa Fe Springs	6	6	..	..	34,500
Seal Beach	3	3	..	..	4,050
Ventura	3	3	..	..	5,650
Wildcats	2	..	..	2	...
Total	70	68	..	2	98,255

OKLAHOMA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod.
Caddo	2	1	..	1	10
Carter	4	3	..	1	235
Cotton	1	1	..	..	30
Creek	24	11	3	10	1,624
Commanche	1	..	..	1	...
Garvin	1	1	..	..	34
Grady	7	1	4	2	22
Hughes	2	..	..	2	...
Jefferson	1	..	..	1	...
Kay	5	1	3	1	80
Kiowa	1	..	..	1	...
Logan	2	..	..	2	...
Marshall	1	1	..	..	30
Muskogee	12	2	4	6	80
Noble	1	..	1	..	...
Okfusgee	15	9	..	6	414
Okmulgee	24	11	3	10	258
Osage	22	15	1	6	895
Pawnee	5	1	3	1	50
Pontotoc	13	8	2	3	2,022
Pottawatomie	52	46	..	6	38,304
Seminole	50	36	..	14	21,155
Stephens	22	11	1	10	316
Tulsa	5	1	..	4	3
Wagoner	6	1	1	4	7
Total	279	161	26	92	65,569

ARKANSAS

Calhoun	1	..	..	1	...
Johnson	3	..	3	..	...
Nevada	1	1	..	..	50
Ouachita	1	1	..	..	470
Union	23	10	4	9	436
Wildcats	8	..	3	5	...
Total	37	12	10	15	956

TEXAS

TEXAS PANHANDLE

Carson	1	..	1	..	....	183,050
Floyd	1	..	..	1	....	.....
Gray	18	13	2	3	2,190	785,400
Hutchinson	7	7	..	..	815	885,500
Hemphill	1	..	..	1	....	.....
Moore	1	..	1	..	....	.....
Potter	1	..	1	..	....	.....
Wheeler	4	..	4	..	....	23,300
Others	..	..	..	..	....	68,950
Total	34	20	9	5	3,005	1,946,200

NORTH TEXAS

Archer	62	30	..	32	1,139	581,700
Burkburnett	1	..	..	1	....	293,200
Clay	2	2	..	..	35	.....
Cook	5	3	..	2	93	.....
Electra	15	10	..	5	718	379,900
Jack	8	3	..	5	185	42,200
KMA-Iowa Park	19	9	..	10	485	112,950
Haskell	1	1	..	..	50	.....
Montague	7	4	2	1	75	303,150
Throckmorton	3	..	..	3	....	.....
Wilbarger	32	18	..	14	5,265	972,150
Young	57	26	..	31	995	.....
Others	..	..	..	..	....	18,000
Total	212	106	2	104	9,050	2,705,350

TEXAS GULF COAST

Barbers Hill	..	..	..	..	....	43,650
Batson	6	5	..	1	28	40,300
Big Creek	3	2	..	1	730	64,150
Blue Ridge	9	5	..	4	3,175	196,550
Boling	..	..	..	..	....	73,100
Damon Md.	..	..	..	..	....	44,600
Goose Creek	4	2	..	2	75	203,950
High Island	2	2	..	..	135	.....
Hull	4	3	..	1	2,095	343,050
Humble	..	..	..	..	....	112,500
Orange	6	4	..	2	202	101,400
Pierce Jct.	5	3	..	2	2,550	312,650
Saratega	4	1	..	3	12	29,000
Sour Lake	2	2	..	..	20	93,550
So. Liberty	6	6	..	..	3,930	154,550
Spindle Top	2	..	..	2	....	1,138,000
Sugar Land	..	..	..	..	....	94,250
W. Columbia	1	1	..	..	100	240,850
Wildcats	20	3	1	16	6,460	.....
Others	..	..	..	..	....	114,550
Total	74	39	1	34	19,512	3,413,650

WEST TEXAS

Crane	2	2	..	..	500	1,601,800
Crockett	..	..	..	..	....	85,700
Howard	21	20	..	1	24,255	928,300
Jones	11	11	..	..	6,490	115,300
Loving	2	2	..	..	60	.....
Mitchell	..	..	..	..	....	80,050
Pecos	9	6	1	2	9,020	2,118,650
Reagan	..	..	..	..	....	518,000
Runnels	1	1	..	..	350	.....
Upton	2	1	..	1	85	.....
Winkler	40	35	1	4	144,715	4,684,950
Wildcats	23	2	..	21	2,030	.....
Others	..	..	..	..	....	4,300
Total	111	80	2	29	187,505	9,875,750

CENTRAL WEST TEXAS

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod.	Monthly Prod.
Brown	53	25	5	23	1,020	313,100
Bruner	1	..	..	1	....	.....
Callahan	18	12	..	6	270	109,700
Coleman	27	8	1	18	609	118,800
Eastland	18	5	4	9	100	212,450
Erath	2	..	1	1	....	.....
McCulloch	3	..	..	3	....	.....
Palo Pinto	2	..	1	1	....	11,000
Parker	1	..	..	1	....	.....
Shackleford	24	17	1	6	820	314,550
Stephens	8	..	3	5	....	224,900
Throckmorton	..	..	..	..	....	24,000
Young	..	..	..	..	....	257,550
Others	..	..	..	..	....	21,000
Total	157	67	16	74	2,819	1,607,050

SOUTHWEST TEXAS

Dale	..	..	..	..	....	26,300
Duval	6	5	1	..	940	.....
Jim Hogg	2	2	..	..	90	.....
Laredo Dist.	..	..	..	..	....	262,900
Luling	..	..	..	..	....	402,250
Lytton Spgs.	..	..	..	..	....	32,650
Salt Flat	5	5	..	..	2,733	.....
Somerset	..	..	..	..	....	21,000
Webb	12	8	2	2	1,770	.....
Zapata	4	1	3	..	200	.....
Wildcats	9	1	2	6	300	.....
Others	..	..	..	..	....	67,250
Total	38	22	8	8	6,033	816,350

EAST TEXAS

Harrison	2	..	2	..	....	.....
Panola	4	..	3	1	....	.....
Shelby	1	1	..	..	154	.....
Total	7	1	5	1	154	.....

EAST CENTRAL TEXAS

Boggy Creek	..	..	..	..	....	50,100
Corsicana	..	..	..	..	....	291,650
Currie	..	..	..	..	....	16,200
Mexia	..	..	..	..	....	193,550
Nigger Creek	..	..	..	..	....	21,000
Richland	..	..	..	..	....	15,000
Wortham	..	..	..	..	....	46,000
Total	..	..	..	..	....	639,500

TEXAS RECAPITULATION

Gulf Coast	74	39	1	34	19,512	3,413,650
East Texas	7	1	5	1	154	.....
E. Central	..	..	..	..	....	639,500
Southwest	38	22	8	8	6,033	816,350
Panhandle	34	20	9	5	3,005	1,946,200
W. Texas	111	80	2	29	187,505	9,875,750
W. Central	157	67	16	74	2,819	1,607,050
N. Texas	212	106	2	104	9,050	2,705,350
Total	633	335	43	255	248,078	21,003,850

LOUISIANA

SOUTH LOUISIANA

Evangeline	5	3	..	2	156	27,850
Edgerly	3	1	..	2	25	24,000
E. Hackberry	1	..	..	1	....	136,600
Lockport	4	2	..	2	2,400	117,300
Sweet Lake	..	..	..	..	....	52,450
Sorrento	..	..	..	..	....	17,650
Sulphur Dome	..	..	..	..	....	84,500
Vinton	6	5	..	1	407	129,100
Wildcats	19	2	..	17	3,200	.....
Others	..	..	..	..	....	46,700
Total	38	13	..	25	6,188	639,150

NORTH LOUISIANA

Belleview	..	..	..	..	....	27,100
Bossier	5	..	2	3	....	.....
Caddo	2	2	..	..	370	368,350
Cataboula	1	..	..	1	....	.....
Claiborne	1	1	..	..	15	.....
Cotton Val.	..	..	..	..	....	116,750
De Soto	1	..	1	..	....	123,700
East Carroll	1	..	..	1	....	.....
Elm Grove	..	..	..	..	....	17,500
Grant	1	..	..	1	....	.....
Haynesville	..	..	..	..	....	174,000
Homer	..	..	..	..	....	123,500
Madison	1	..	..	1	....	.....
Morehouse	3	..	1	2	....	.....
Ouachita	5	..	4	1	....	.....
Pleasant Hill	..	..	..	..	....	15,850
Richland	3	..	2	1	....	.....
Union	3	1	1	1	128	.....
Urania	..	..	..	..	....	186,350
Webster	4	..	..	4	....	.....
Wildcats	8	..	..	8	....	.....
Total	39	4	11	24	513	1,158,100

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BENAVIDES, TEXAS
EL DORADO, ARKANSAS
SEAL BEACH, CALIFORNIA

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1927	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Ave.	United States Total
September	797,450	105,200	493,750	142,900	53,450	101,350	110,800	74,500	637,250	2,516,650	75,498,900
October	782,300	105,100	497,900	138,400	51,300	100,450	113,600	73,250	629,000	2,491,300	77,230,000
November	766,900	106,650	501,750	138,100	49,400	97,850	114,900	75,050	623,850	2,474,450	74,233,500
December	720,700	106,150	531,650	138,500	47,200	94,950	111,250	77,150	624,600	2,452,150	76,017,050
1928											
January	675,450	108,300	523,300	125,450	45,250	90,050	109,600	77,000	617,100	2,371,500	73,516,500
February	664,450	110,550	538,750	115,800	45,300	88,250	104,850	75,550	614,750	2,358,250	68,388,850
March	646,850	112,250	575,850	119,900	44,400	85,600	102,150	78,700	617,450	2,383,150	73,877,650
April	620,450	112,150	617,850	118,850	46,900	83,450	107,000	78,500	613,550	2,398,700	71,961,100
May	610,100	108,750	561,450	129,850	43,600	91,250	112,100	82,200	630,900	2,370,200	73,476,300
June	594,850	105,200	554,400	135,400	42,350	102,850	109,300	82,400	643,400	2,370,150	71,104,500
July	587,150	102,750	597,250	133,650	42,150	90,700	113,400	80,400	644,700	2,392,150	74,156,600
August	656,350	102,200	604,000	130,200	40,200	87,500	113,300	77,700	634,150	2,445,600	75,534,600
September	724,850	99,750	604,150	129,500	39,050	84,700	112,550	78,850	631,650	2,505,050	75,151,500
October	741,350	97,900	598,550	129,950	38,800	83,550	114,000	83,300	624,450	2,511,850	77,867,800
November	715,750	96,600	586,350	135,100	38,600	83,000	109,700	81,150	653,050	2,499,300	74,978,300
Dec. 1	708,600	97,250	582,950	132,150	38,200	82,100	110,000	78,100	676,800	2,506,150	17,543,050
Dec. 8	705,300	97,950	598,750	132,400	37,750	83,950	112,000	73,150	679,600	2,520,850	17,645,950
Increase	.....	700	15,800	250	.....	1,850	2,000	.....	2,800	14,700	102,900
Decrease	3,300	.....	.....	.....	450	.....	.....	4,950	.....	.....	.....

TEXAS

(Outside Gulf Coast)

PANHANDLE DISTRICT

	Dec. 8	Dec. 1
Carson County	6,000	6,100
Gray County	24,350	23,900
Hutchinson County	28,000	28,100
Wheeler County	800	800
Others	3,450	2,700
Total	62,600	61,600

NORTH TEXAS

Archer County	19,150	19,250
Burkburnett	10,000	9,950
Electra	12,950	12,800
Iowa Park-KMA	3,900	3,850
Montague and Cooke Cos.	9,950	10,050
Wilbarger	33,100	32,650
Others	600	600
Total	89,650	89,150

WEST CENTRAL TEXAS

Brown County	10,250	10,150
Callahan County	3,900	3,850
Coleman County	4,100	3,900
Eastland-Desdemona	7,050	6,950
Jack County	1,300	1,300
Palo Pinto County	350	350
Shackelford County	10,400	10,550
Stephens County	7,600	7,550
Throckmorton County	800	800
Young County	8,550	8,750
Others	700	700
Total	55,000	54,850

WEST TEXAS

Crane-Upton Counties	52,650	54,000
Crockett County	2,750	2,850
Howard & Glasscock	36,600	33,000
Jones County	6,650	5,000
Mitchell-Scurry Cos.	2,700	2,750
Pecos County	71,300	70,400
Reagan County	17,050	17,200
Winkler County	146,900	141,200
Others	1,700	1,450
Total	338,300	327,850

EAST CENTRAL TEXAS

Boggy Creek	2,850	1,700
Corsicana-Powell	9,900	10,000
Currie	500	500
Mexia	6,300	6,350
Nigger Creek	700	700
Richland	500	500
Wortham	1,500	1,500
Total	22,250	21,250

SOUTHWEST TEXAS

Dale	850	850
Laredo District	9,550	8,950
Luling	13,400	13,500
Lytton Springs	1,100	1,150
Somerset	700	700
Salt Flat	4,400	2,300
Others	950	800
Total	30,950	28,250
T'tl Tex. (Outside Gulf Coast)	598,750	582,950

TEXAS GULF COAST

Barbers Hill	500	600
Batson	1,350	1,350
Big Creek	1,900	1,800
Blue Ridge	5,000	5,700
Boling	2,800	2,900
Damon Mound	1,000	1,000
Goose Creek	6,600	6,750
Hull	10,550	10,750
Humble	3,750	3,750
Orange County	3,300	3,450
Pierce Junction	10,100	10,650
Saratoga	950	950
Sour Lake	3,200	3,000
South Liberty	5,650	5,900
Spindle Top	36,450	35,500
West Columbia	7,650	8,000
Sugarland	4,800	4,800
Others	3,950	2,850
Total	109,500	109,750
Texas Total	708,250	692,700

OKLAHOMA

North Braman	2,700	2,700
South Braman	1,300	1,350
Blackwell	3,300	3,050
Hubbard	2,300	2,350
Thomas	1,100	1,100
Tonkawa	11,750	11,750
Garber	7,050	7,100
Burbank	25,050	25,300
Osage (Outside Burbank)	25,950	26,000
Cushing	20,000	20,000
Yale Jennings	7,650	7,650
Davenport	1,650	1,650
Pristow-Slick	20,150	20,200
North Okmulgee	14,400	14,400
Lyons Deaner	4,250	4,250
Cromwell	8,050	8,150
Papoose	4,000	4,000
Wewoka	5,400	5,400
Seminole	41,600	40,900
Bowlegs	48,100	48,900
Searight	10,400	10,150
Little River	95,600	100,650
Earlsboro	76,200	75,300
Duncan District	7,750	7,750
Graham	4,750	4,750
Fox	1,600	1,600
Healdton	13,650	13,700
Hewitt	9,000	9,000
Scholem Alechem	14,350	14,500
Pearson	1,950	1,900
St. Louis	128,150	132,150
Allen	26,450	24,900
Others	59,700	56,050
Total	705,300	708,600

CALIFORNIA

Santa Fe Springs	76,500	70,500
Long Beach	190,000	192,000
Huntington Beach	50,500	51,000
Torrance	16,000	16,000
Dominguez	10,000	10,000
Rosecrans	6,500	6,500
Inglewood	27,600	27,800
Midway-Sunset	75,000	75,000
Ventura Avenue	52,000	52,000
Seal Beach	28,500	28,500
Others	147,000	147,500
Total	679,600	676,800

KANSAS

Greenwood County	25,300	25,500
Florence-Covert	1,000	1,000
Peabody-Ebling	3,250	3,250
Eldorado-Towanda	12,900	12,900
Augusta-Fox Bush	3,250	3,200
Rainbow Bend	1,250	1,300
Russell	3,700	4,000
Churchill	8,150	7,700
Oxford	7,450	7,100
Others	31,700	31,300
Total	97,950	97,200

NORTH LOUISIANA

	Dec. 8	Dec. 1
Homer	4,100	4,100
Haynesville	5,650	5,800
Caddo Light	9,150	9,350
Caddo Heavy	2,950	2,950
DeSoto-Red River	4,100	4,150
Elm Grove	600	600
Bellevue	850	850
Cotton Valley Light	450	450
Cotton Valley Heavy	3,350	3,400
Urania	6,050	6,050
Pleasant Hill	500	500
Totals North Louisiana	37,750	38,200

LOUISIANA GULF COAST

Bayou Boullion	600	500
East Hackberry	5,300	5,250
Edgerly	800	800
Evangeline	900	900
Lockport	3,900	3,900
Sorrento	1,500	550
Sulphur Dome	3,600	4,000
Sweet Lake	1,400	1,350
Vinton	4,050	4,200
Others	850	950
Total Louisiana Gulf Coast	22,900	22,400
Louisiana Total	60,650	60,600

ARKANSAS

El Dorado	4,950	4,950
Champagnolle	14,150	12,250
Smackover Light	7,150	7,150
Smackover Heavy	53,650	53,650
Stepehns	1,000	1,000
Nevada	1,250	1,300
Lisbon	1,700	1,700
Others	100	100
Total	83,950	82,100

MOUNTAIN STATES

WYOMING

Salt Creek	29,750	35,400
Grass Creek	2,350	2,350
Elk Basin	1,000	1,000
Big Muddy	2,550	2,550
Lost Soldier	3,650	3,650
Rock River	2,250	2,500
Lance Creek	350	350
Oregon Basin	3,500	3,500
Others	5,500	5,500
Total	50,900	56,800

MONTANA

Cat Creek	1,500	1,500
Sunburst	7,950	7,950
Pondera	1,400	2,000
Others	100	100
Total	10,950	11,550

COLORADO

Moffats (Craig)	1,150	1,250
Fort Collins	2,050	2,250
Florence	1,350	1,250
Others	2,350	2,300
Total	6,900	7,050

NEW MEXICO

Table Mesa	100	...
Artesia	1,050	1,050
Hogback	550	500
Rattlesnake	2,600	1,050
Others	100	100
Totals	4,400	2,700
Totals Mountain States	73,150	78,100

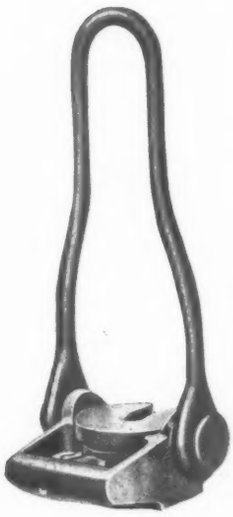
EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., and N. Y.)	112,000	110,000

PRODUCTION SUMMARY

East of Rockies	1,768,100	1,751,000
Total U. S.	2,520,850	2,506,150

Load capacity greatly in excess of the longest string...



D+B Simplex Sucker Rod Elevator

THE fundamental requirements of safety and speed in operation are built into this D+B combination...the D+B Simplex Safety Hook and the D+B Simplex Sucker Rod Elevator.

Designed for compactness with exceptional strength to carry heavy loads.

The hook is equipped with Timken roller bearings, mounted in the trunnion, which takes care of the thrust and pull when in service. The lock is operated by a downward pressure or weight of the elevator and rods. Once locked it cannot be released except by deliberate pressure on the latch trip in the hand grip.

Designed to swing into the elevator bail from any angle. Tested to withstand strains greatly in excess of rated capacity.

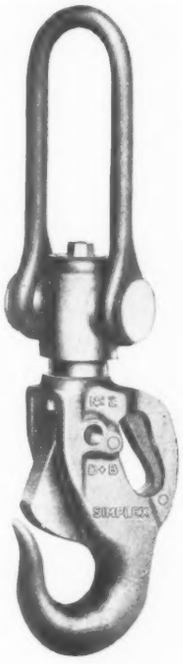
The D+B Simplex Elevator has a non-tipping body and a specially heat treated wear plate. Plates are interchangeable, making the elevators adaptable to different sizes of rods.

The rod socket is rounded to conform with API specifications for upset ends.

The rod is held within the body of the elevator by drop forged heat treated jaws in such a manner that any outward travel is checked until jaws are intentionally released.

The latch operates automatically when elevator is placed on the rods. Releasing requires only a gripping action of the hand. This method of latching gives the utmost ease in application while affording every protection to the user.

Write for descriptive Bulletin No. 2 of Sucker Rods and allied equipment.



D+B Simplex Safety Hook

D&B DIVISION

EMSCO DERRICK & EQUIPMENT COMPANY
LOS ANGELES, CALIF., HOUSTON, TEXAS-DALLAS, TEXAS
U. S. A.
EXPORT OFFICE: 150 BROADWAY
NEW YORK CITY, N. Y.
U. S. A.

EMSCO STEEL EQUIPPED WELLS ARE SAFE

Say you saw it in The OIL WEEKLY

CRUDE OIL PRICE QUOTATIONS

CURRENT POSTINGS

EASTERN STATES

	Dec. 11 1928
Penna Grade Oil in New York Transit Lines (New York)	$3.60
Bradford District Oil in National Transit Lines (Pennsylvania)	3.60
Penna Grade Oil in National Transit Lines (Pennsylvania)	3.50
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	3.50
Penna Grade Oil in Eureko Pipe Line Lines (Pennsylvania)	3.40
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.25
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (July 13)	1.45
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s lines (August 8)	1.70
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines (Aug. 8)	1.80
Somerset Oil in Cumberland Pipe Line lines (Kentucky) (Sept. 14, 1928)	1.75
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (August 1)	.95
Keister (Pennsylvania)	1.20

CENTRAL STATES

Illinois	1.55
Indiana	1.37
Lima	1.60
Plymouth	1.28
Princeton	1.55
Waterloo	1.35
Wooster	1.77

WESTERN KENTUCKY

Posted by Stoll Refining Company for crude from Allen, Warren, Franklin, Davies, Barren.

All grades	1.75

MID-CONTINENT

Carter Oil Company, Gulf Pipe Line Company, Sinclair Pipe Line Company, Prairie Oil and Gas Company and The Texas Company.*

25. to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 and above	1.76

*The Texas Company posts a price of 60 cents on 24 to 24.9 gravity, and Gulf's posting begins at 28 to 28.9.

MID-CONTINENT

Magnolia Petroleum Company

Below 25 gravity	.60
25 to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 29.9 gravity	.75
30 to 30.9 gravity	.90
31 to 31.9 gravity	1.05
32 to 32.9 gravity	1.16

From 33 to 44 gravity and above, Magnolia Petroleum Company prices are the same as those of Carter Oil Company.

NORTH AND CENTRAL TEXAS

Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude (Humble Oil and Refining Company)*

25 to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 and above	1.76

SOUTH TEXAS

Mirando	1.00

SOMERSET

Grayburg

	Dec. 11 1928
Below 33 gravity	1.05
33 to 33.9 gravity	1.07
34 to 34.9 gravity	1.09
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.13
37 to 37.9 gravity	1.15
38 and above	1.17

GULF COAST

Grade "A" all companies	1.20
Gulf Coast Light Oil, below 25	1.15
25 to 25.9 gravity	1.17
26 to 26.9 gravity	1.19
27 to 27.9 gravity	1.21
28 to 28.9 gravity	1.23
29 to 29.9 gravity	1.25
30 to 30.9 gravity	1.27
31 to 31.9 gravity	1.29
32 to 32.9 gravity	1.31
33 to 33.9 gravity	1.33
34 to 34.9 gravity	1.35
35 to 35.9 gravity	1.37
36 to 36.9 gravity	1.39
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.43
39 to 39.9 gravity	1.45
40 and above	1.47

*Humble Oil & Refining Company's postings on Gulf Coast Light stop at 35 to 35.9. Its price on all crudes above 35 to $1.37 per barrel.

Magnolia Petroleum Company's postings stop at 31 to 31.9.

MARKHAM

The Texas Company

All grades	1.00

LULING

All grades	1.00

PANHANDLE GRAY COUNTY

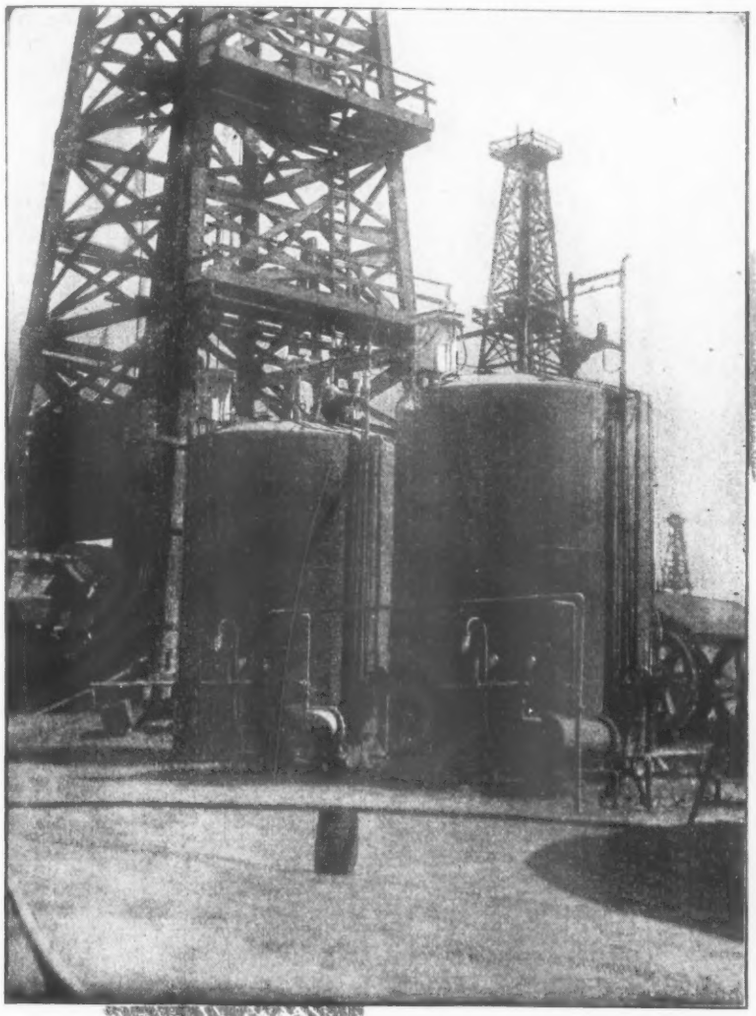
(Humble Oil and Refining Company, Magnolia Petroleum Company, Gulf Pipe Line Company and Sinclair Pipe Line Company).

Below 29 gravity	.68
29 to 29.9 gravity	.75
30 to 30.9 gravity	.82
31 to 31.9 gravity	.89
32 to 32.9 gravity	.96
33 to 33.9 gravity	1.01
34 to 34.9 gravity	1.06
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.16
37 to 37.9 gravity	1.21
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.31
40 to 40.9 gravity	1.36

CALIFORNIA CRUDE OIL PRICES AT THE WELL

Following are the current prices offered by Standard Oil Company for crude oil at the well: (Price per barrel of 42 gallons in fields indicated.

Gravity	Signal Hill	Alamitos Hts Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler
14-14.9	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ ...	$ .50	$ .75	$ .75	$ .75	$ .75	$ .75
15-15.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
16-16.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
17-17.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
18-18.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
19-19.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
20-20.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.86	.85	...	..	.77	.77	.77	.77	.77
21-21.9	.89	.89	.89	.89	.89	..	.89	.89	.88	.89	.88	.89	..	.79	.79	.79	.79	.79
22-22.9	.93	.93	.93	.93	.93	..	.93	.93	.91	.92	.91	.92	..	.82	.82	.82	.82	.82
23-23.9	.97	.97	.97	.97	.97	..	.97	.97	..	.95	.94	.95	..	.86	.86	.86	.85	.85
24-24.9	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	..	.98	.97	.98	..	.90	.90	.90	.88	.88
25-25.9	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	..	1.01	1.00	1.01	..	.95	.95	.95	.91	.91
26-26.9	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	..	1.04	1.04	1.04	..	1.00	1.00	1.00	.94	.94
27-27.9	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	..	1.07	1.08	1.07	..	1.05	1.05	1.05	.98	.97
28-28.9	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	..	1.10	1.12	1.10	..	1.10	1.10	1.10	1.02	..
29-29.9	1.21	1.21	1.21	..	1.21	1.21	..	1.21	..	1.13	1.16	1.15	..	1.16	1.16	1.16	1.06	..
30-30.9	1.25	1.25	1.25	..	1.25	1.25	..	1.25	..	1.16	1.20	1.20	..	1.22	1.22	1.22	1.10	..
31-31.9	1.30	1.30	1.30	..	..	1.30	..	..	..	..	..	1.25	..	1.28	1.28	1.28	1.14	..
32-32.9	1.35	1.35	1.35	..	..	1.35	..	..	..	..	..	1.30	..	1.34	1.34	1.34	1.18	..
33-33.9	..	..	..	..	..	1.41	..	..	..	..	..	1.35	..	1.40	1.40	1.40	1.22	..
34-34.9	..	..	..	..	..	1.47	..	..	..	..	..	1.40	..	..	..	1.46	1.26	..
35-35.9	..	..	..	..	..	1.53	..	..	..	..	..	1.45	..	..	..	..	1.30	..
36-36.9	..	..	..	..	..	1.59	..	..	..	..	..	1.50	..	..	..	..	..	..
37-37.9	..	..	..	..	..	1.65	..	..	..	..	..	1.55	..	..	..	..	..	..
38-38.9	..	..	..	..	..	1.71	..	..	..	..	..	1.60	..	..	..	..	..	..
39-39.9	..	..	..	..	..	1.77	..	..	..	..	..	1.65	..	..	..	..	..	..
40-40.9	..	..	..	..	..	1.83	..	..	..	..	..	..	..	..	..	..	..	..
41-41.9	..	..	..	..	..	1.89	..	..	..	..	..	..	..	..	..	..	..	..
42-42.9	..	..	..	..	..	1.95	..	..	..	..	..	..	..	..	..	..	..	..



A Typical "Petreco" Installation.

Petreco

The total cost of "Petreco" Electrical Dehydration including steam, electricity, labor, repairs, interest and depreciation, has been found to range from one to a maximum of three cents per barrel of *net oil recovered.*

PETROLEUM RECTIFYING COMPANY of CALIFORNIA

Security Title Insurance Bldg. 530 West 6th Street, Los Angeles, Calif.

Petroleum Bldg. Houston, Texas

5163

If your production is "cut" let the Official Oil Doctor prescribe for you. Our book—"The Electrical Process for the Dehydration of Crude Oil Emulsions" will be sent to you on request.

Say you saw it in The OIL WEEKLY

	Dec. 11 1928
41 to 41.9 gravity	1.41
42 to 42.9 gravity	1.46
43 to 43.9 gravity	1.51
44 and above	1.56

WHEELER COUNTY
(Humble Oil and Refining Company and Magnolia Petroleum Company)

Below 30 gravity	.65
30 to 30.9 gravity	.72
31 to 31.9 gravity	.79
32 to 32.9 gravity	.86
33 to 33.9 gravity	.91
34 to 34.9 gravity	.96
35 to 35.9 gravity	1.01
36 to 36.9 gravity	1.06
37 to 37.9 gravity	1.11
38 to 38.9 gravity	1.16
39 to 39.9 gravity	1.21
40 to 40.9 gravity	1.26
41 to 41.9 gravity	1.31
42 to 42.9 gravity	1.36
43 to 43.9 gravity	1.41
44 and above	1.46

CARSON-HUTCHINSON COUNTIES
(Humble Oil and Refining Company, Magnolia Petroleum Company and Gulf Pipe Line Company)

Below 32 gravity	.69
32 to 32.9 gravity	.76
33 to 33.9 gravity	.81
34 to 34.9 gravity	.86
35 to 35.9 gravity	.91
36 to 36.9 gravity	.96
37 to 37.9 gravity	1.01
38 to 38.9 gravity	1.06
39 to 39.9 gravity	1.11
40 to 40.9 gravity	1.16
41 to 41.9 gravity	1.21
42 to 42.9 gravity	1.26
43 to 43.9 gravity	1.31
44 and above	1.36

WEST TEXAS
(Humble, Gulf, Magnolia, The Marland Company and Southern Crude Oil Purchasing Company)*

Crane-Upton, Crockett, Pecos and Winkler Counties, all grades	.65

*Gulf does not post in Winkler County; Magnolia posts in Crane, Upton and Winkler Counties and that part of Glasscock not included in the Chalk field. The Marland Company posts only in Crane, Upton and Crockett Counties; Southern posts only in Crane, Upton and Winkler Counties.

(Magnolia Petroleum Company)

Mitchell County	$ .80
Howard-Glasscock County (shallow)	.80
Howard-Glasscock County (deep)	.65

Col-Tex Refining Company

Howard and Mitchell Counties	$ .80

WYOMING-MONTANA
Wyoming

Byron	1.33
Ferris	1.60
Elk Basin	1.48
Grass Creek	1.48
Rock Creek	1.33
Lost Soldier	.95
Lance Creek	1.48
Mule Creek	1.10
Notches	.65
Big Muddy	1.33
Osage	1.33
Hamilton Dome	.85
Pilot Butte	1.75
Torchlight-Greybull	1.33
Lander	.80
Simpson Ridge	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

Salt Creek
Midwest Refining Company

29 to 29.9 gravity	1.14
30 to 30.9 gravity	1.16
31 to 31.9 gravity	1.18
32 to 32.9 gravity	1.20
33 to 33.9 gravity	1.22
34 to 34.9 gravity	1.24
35 to 35.9 gravity	1.26
36 to 36.9 gravity	1.28
37 and above	1.30

MONTANA

Sunburst	$1.65
Cat Creek	1.33
Lake Basin	2.20

NEW MEXICO

	Dec. 11 1928
Artesia	1.08
Hogback	1.38

CANADA

Oil Springs	2.07
Petrolia	2.00

NORTH LOUISIANA
(The Texas Company)

24 to 24.9 gravity	.76
25 to 25.9 gravity	.81
26 to 26.9 gravity	.86
27 to 27.9 gravity	.91
28 to 28.9 gravity	.96
29 to 29.9 gravity	1.01
30 to 30.9 gravity	1.06
31 to 31.9 gravity	1.11
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.19
34 to 34.9 gravity	1.22
35 to 35.9 gravity	1.25
36 to 36.9 gravity	1.28
37 to 37.9 gravity	1.31
38 to 38.9 gravity	1.34
39 to 39.9 gravity	1.37
40 to 40.9 gravity	1.40
41 to 41.9 gravity	1.43
42 to 42.9 gravity	1.46
43 to 43.9 gravity	1.49
44 to 44.9 gravity	1.52
45 to 45.9 gravity	1.55
46 to 46.9 gravity	1.58
47 to 47.9 gravity	1.61
48 to 48.9 gravity	1.64
49 to 49.9 gravity	1.67
50 to 50.9 gravity	1.70
51 to 51.9 gravity	1.73
52 and above	1.76

LOUISIANA-ARKANSAS
Homer, Haynesville, Caddo, El Dorado, De Soto and Crichton and Cotton Valley**
(Atlantic Oil Producing Company, Standard of Louisiana, Magnolia Petroleum Company and The Texas Company).

	Dec. 11 1928
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 gravity and above	1.76

*Shreveport-Eldorado's postings stop at above 40 gravity.

**Below 36 gravity, the posting on Cotton Valley is 75 cents. From 36 to 52 and above the regular gravity schedule is followed.

STEPHENS
(All Companies)

Below 28 gravity	75
28 to 28.9 gravity	.79
29 to 29.9 gravity	.83
30 to 30.9 gravity	.87
31 to 31.9 gravity	.91
32 gravity and above	.95

SMACKOVER
(All Companies)

Below 24 gravity	.75
24 and above	.90
Bellevue	1.25
Jennings	1.15
Vinton	1.30
Edgerly	1.30
Starks Dome	1.30
Urania	.85
Calion	.75

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS
American Petroleum Institute Figures (Barrels of 42 gallons)

	Week Ended Dec. 1	Week Ended Nov. 24
AT ATLANTIC COAST PORTS—		
Baltimore	68,000	184,000
Boston	71,000	*135,000
New York	1,009,000	1,245,000
Philadelphia	98,000	340,000
Others	114,000	.....
Total	1,360,000	1,904,000
Daily Average	194,286	272,000
AT GULF COAST PORTS—		
Galveston District	.....	40,000
New Orleans and Baton Rouge	242,000	93,000
Port Arthur and Sabine District	.....	139,000
Tampa	.....	.....
Total	242,000	272,000
Daily Average	34,571	38,857
AT ALL UNITED STATES PORTS—		
Total	1,602,000	2,176,000
Daily Average	228,857	310,857
Daily Average Four Weeks Ended	241,036	258,071

CALIFORNIA OIL RECEIPTS AT ATLANTIC AND GULF COAST PORTS

RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS
American Petroleum Institute Figures (Barrels of 42 Gallons)

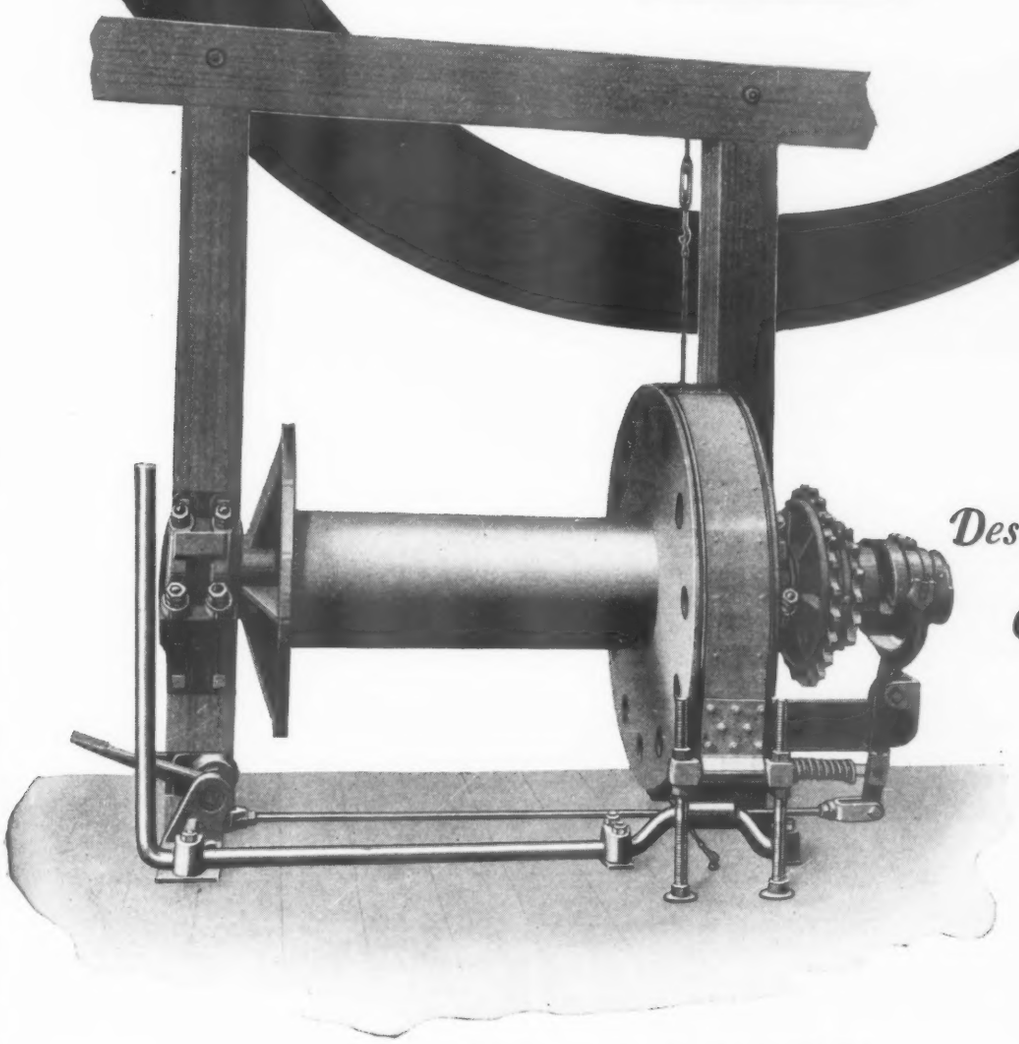
	Week Ended Dec. 1	Week Ended Nov. 24
AT ATLANTIC COAST PORTS—		
Baltimore	266,000	148,000
Boston	80,000	.....
New York	154,000	148,000
Philadelphia	.....	158,000
Others	23,000	.....
Total	523,000	454,000
Daily Average	74,714	64,857
AT GULF COAST PORTS	.....	.....
Daily Average	.....	.....
TOTAL—ATLANTIC AND GULF COAST PORTS	523,000	454,000
Daily Average	74,714	64,857
Daily Average Four Weeks Ended	75,857	67,536
Distribution of total California Oil Receipts is as follows:		
Crude	73,000	.....
Gasoline	374,000	382,000
Gas Oil	.....	72,000
Kerosene Distillate	76,000	.....
Total	523,000	454,000

*Revised.

NATIONAL TUBING HOIST

Type "BJ"

THE NATIONAL SUPPLY COMPANIES



Descriptive Bulletin No. 14N. On Request

Say you saw it in The OIL WEEKLY

COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

SUMMARIZED REVIEW OF FIELD RESULTS

State—	Completions This Week	Completions Last Week	Producers This Week	Producers Last Week	Gas Wells This Week	Gas Wells Last Week	Failures This Week	Failures Last Week	Initial Production This Week	Initial Production Last Week
Arkansas	3	1	3	1	..	..	..	..	1,823	652
California	10	12	7	11	..	..	3	1	13,400	13,390
Illinois	6	6	4	3	..	..	2	3	42	34
Indiana	5	1	4	1	1	..	..	..	75	5
Kansas	10	13	5	8	1	2	4	3	410	900
Kentucky	39	23	27	15	3	2	9	6	625	587
Louisiana	16	17	6	3	3	2	7	12	510	121
Michigan	8	6	8	2	..	4	..	..	1,515	1,350
Ohio	55	54	27	19	15	22	13	13	637	572
Oklahoma	77	71	46	43	10	4	21	24	18,747	21,178
Pennsylvania	3	8	1	1	1	5	1	2	400	1
Texas	158	109	90	69	3	6	65	34	95,833	56,906
West Virginia	40	30	10	6	25	23	5	1	60	36
Total	430	351	238	182	62	70	130	99	134,077	95,732
Increase this week	79	..	56	..	..	..	31	..	38,345	...
Decrease this week	..	..	..	..	8	..	..	..	...	...

OKLAHOMA

Company, well and Location	Initial Production Bbls.	Depth
CARTER COUNTY—		
Magnolia Pet. Co., Gill 1, se ne se 23-1s-3w	95	2632
Hall & Brisbee, Miller 4, se ne sw 29-1s-3w	50	2990
Magnolia Pet. Co., Denny 2, nw ne ne 30-1s-3w	50	3072
Gillespie 1, se sw nw 33-1s-3w	48	3986
Hefner 4, ne nw sw 33-1s-3w	85	3991
M. T. Smith et al Jones 1, sw nw se 26-1s-3w	*	3200
COAL COUNTY—		
McGraw et al, Patton 1, sw se ne 35-1n-8e	10	1940
COTTON COUNTY—		
Moore et al, Moore 2, cnl nw sw 2-2s 10w	*	2703
CREEK COUNTY—		
Atlantic Oil Prod. Co., Scott 2, swc ne nw 23-14-10	30	2665
Madden & Madden et al, Wright 3, swc se 13-15-9	750	3403
F. R. Billingslea, Deer 1, nwc ne 19-17-9	*	3475
T. Wheeler et al, Smith 1, nwc 32-17-11	*	2802
A. J. Spears, Glenn 8, swc ne nw, 11-17-12	*	1808
GARVIN COUNTY—		
Magnolia Pet. Co., Harris 7, nw sw nw 16-1n-3w	¶3	1728
Markham et al, Derdyn 3, sw ne nw ne, 20-1n-3w	20	2090
GRADY COUNTY—		
Magnolia Pet. Co., Smith 8, nw se ne 35-5n-8w	¶34	2170
Okla. Gas Utl. Co., Taylor 2, osl n/2 nw se, 2-4n-8w	¶13	2345
Magnolia Pet. Co., Harrison 1, se ne se ne, 28-3n-5w	28	1918
HUGHES COUNTY—		
Gypsy Oil Co., Tiger 1, sw ne 5-8-9e	¶14	3516
Sutton et al, Meadors 1, c ne se, 27-9-10e	¶10	2810
KAY COUNTY—		
Carter Oil Co. & Ona Oil Co., Lambing 1, c ne ne, 19-29-1e	525	3355
D. J. Wilson, Meuret 1, c sw ne, 14-27-1e	¶2	680
KIOWA COUNTY—		
J. M. Burke, Menton 1, sw nw, 4-6n-16w	*	936
MARSHALL COUNTY—		
Armstrong, Sullivan 1, nw ne sw nw, 30-5s-5e	*	628
MUSKOGEE COUNTY—		
Bryan and Emery, Barnett 5, cwl se ne, 8-13-15e	10	1629
Grubs & Young, Friday 4, nw sw nw, 8-15-15e	*	1688
W. C. Cushing, Myers 1, se sw sw, 23-15-17e	*	2445
J. R. Parks, Myers 1, ne sw ne, 25-14-18e	*	2240
OKFUSKEE COUNTY—		
Champlin Oil & Ref. Co., Jacobs 12, nw se se, 15-11-11e	150	3480
Atlantic Oil Prod. Co., Simmer 4, cnl s/2 ne se, 11-10-11e	75	2028
Dixie Oil Co., Drew 1, ne sw, 8-13-10e	*	3407
OKMULGEE COUNTY—		
Tidal Oil Co., Mathews 10, sw se, 24-15-14e	7	1580
Paraffine Oil Co., & Reliance Oil Co., Lacey 4, (Twin), se ne sw, 23-16-11e	2	1728
Dixie Oil Co., McKendre 1, se nw, 17-13-11e	¶33	2499
Sheldon Oil Co. et al, Skelton 4, csl sw se 15-13-12e	25	2897
OSAGE COUNTY—		
McCune et al, No. 11, nw ne se sw, 15-24-8e	5	476
Corbin and Hayer, No. 7, nw se sw, 16-23-11e	25	1684
Pioneer Pet. Co., No. 7, ne nw ne sw, 5-20-11e	20	1719
PAWNEE COUNTY—		
Magnolia Pet. Co., Vickers 3, sw nw ne, 15-20-6e	20	3126
PONTOTOC COUNTY—		
Louisiana Oil Ref. Co., Perry 16, sw nw ne, 19-5-8e	1100	2632
Cal Cul Oil Co., Cynda 1, owdd, sw nw sw, 24-5-7e	¶80	2659
Magnolia Pet. Co., Harjo 1, nw ne sw, 13-5-7e	¶13½	2385
American Oil & Ref. Co., Jones 1, ne 18-5-5e	40	2558
Westheimer & Daube, Millner 4, sw se se, 8-5-8e	*	4283
POTTAWATOMIE COUNTY—		
T. B. Slick, Lynn 2, se ne nw, 30-7-5e	670	4476
Gypsy Oil Co., Stahl 8, se ne, 30-7-5e	210	4343
Magnolia Pet. Co., Fyke "B" 1, ne nw se, 20-7-5e	435	4351
Pure Oil Co., Thomas 1, se ne ne, 26-7-4e	4310	4273
The Texas Co., Cherry 2, se nw nw 25-7-4e	1125	4323
Gypsy Oil Co., Collins 4, se ne se, 25-7-4e	120	4196
Barnsdall Oil Corp., Denial 1, ne sw sw	*	....
Gypsy Oil Co., Collins 3, sw ne se, 25-7-4e	125	4245
Bruno 4, nw ne nw, 25-7-4e	90	4457
Sinclair O. & G. Co., Blandin 12, okdd, se sw sw, 24-7-4e	2115	4294
Panther Oil Co., Townsite 2, nw 23-7-4e	180	4072
Magnolia Pet. Co., Singletary 3, sw se sw, 14-7-4e	139	3864
SEMINOLE COUNTY—		
Carter Oil Co., Tewee 5, se nw ne, 14-7-6e	633	4445
Blackwell Oil & Gas Co., Talley 4, se sw sw, 14-7-6e	600	4222
Shell Pet. Corp., Johnson 4, se sw nw 13-7-6e	1245	4502
Pure Oil Co., Hollins 1, se nw nw, 11-7-6e	715	5103
Magnolia Pet. Co., Denby 4, sw se nw, 11-7-6e	650	4160
Gypsy Oil Co., Baby 1, sw ne, 6-8-6e	20	4268
T. B. Slick & Skelly Oil Co., Campbell 2, ne se nw, 6-9-6e	1555	4438
Gypsy Oil Co., Warledo 1, se nw ne 21-10-7e	*	3830
T. B. Slick, William 8, nw se ne, 15-7-6e	*	4471
Continental Oil Co., Milsey 1, sw 11-7-6e	*	4990
T. B. Slick, Jones 2, se sw se, 3-8-6e	*	4451
STEPHENS COUNTY—		
Magnolia Pet. Co., Kagay 18, sw se se sw, 34-1s-8w	140	1648
Hedrick et al, Pool 1, nw sw sw sw, 35-1s-8w	110	1924
Humble Oil & Ref. Co., Rucktashel 1, se ne ne, 11-1s-4w	45	3622
Clark and Cowden, Davidson 2, se nw sw, 13-1s-4w	225	3042
Twin State Oil Co., Cole 1, ne 14-1s-4w	120	3700
Nance & Heath, Albright 1, ne sw, 27-1n-8w	*	....
Roy Carter, Simpson 5, ne nw sw se, 34-1s-8w	*	2148
Pace et al, Bush 1, ne nw, 3-2s-8w	*	1688
WAGONER COUNTY—		
Elk Drilling Co., Childers 6, nw se nw, 22-18-17e	¶8	812
Peterson & Young, Jameson 3, ne sw sw, 23-16-16e	*	1090

KANSAS

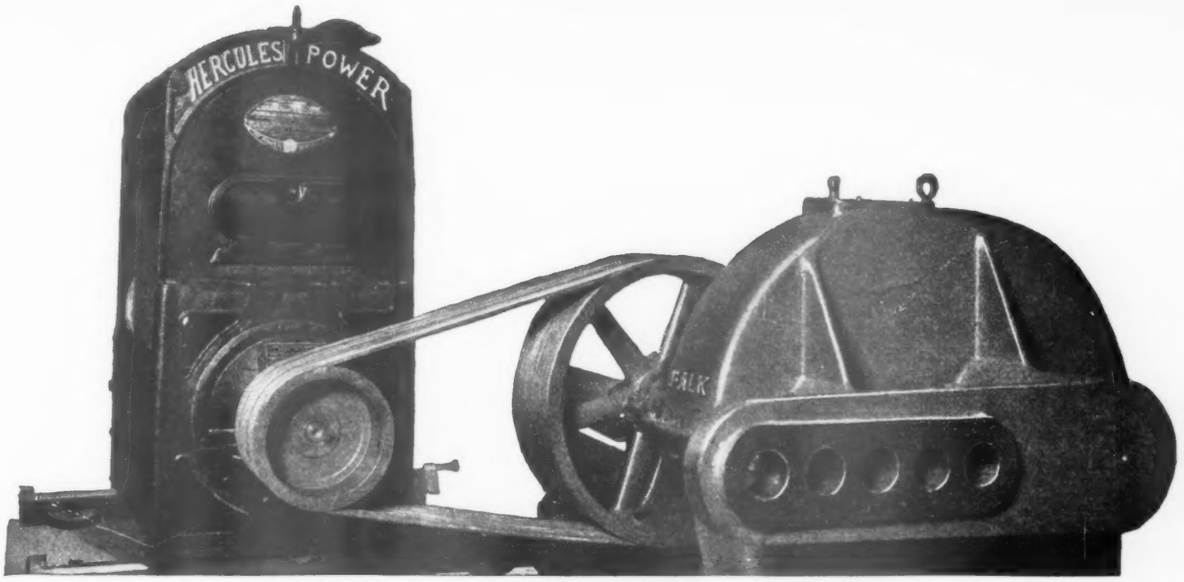
Company, Well and Location	Initial Production Bbls.	Depth
BUTLER COUNTY—		
Empire O. & R. Co., Sherrock 3, ne se sw, 27-27-5e	175	2750
Brandenberger "A" 3, se sy ne, 22-27-5e	150	2746
Dixie Oil Co., Albers 2, sw se, 21-25-4e	25	2628
CLAY COUNTY—		
Roth & Faurot, Bradberry 1, se nw, 21-9-4e	20	1772
COWLEY COUNTY—		
Independent O. & G. Co., Shrock 1, se ne ne, 21-31-4e	*	2530
ELK COUNTY—		
E. B. Shawver, Ferguson 1, sw nw nw, 3-31-8e	*	2855
ELLIS COUNTY—		
Streeter & Stearns, Slimmer 1, nw se, 2-11-17w	*	3522
GREENWOOD COUNTY—		
Murphy et al, Olson 6, ne sw ne se, 6-25-9e	40	2130
McPHERSON COUNTY—		
McPherson O. & G. Co., Anderson 2, C sw ne, 31-18-2w	¶20½	2980
OSBORNE COUNTY—		
Johnson et al, Couley 1, c nw ne, 15-8-15w	*	3607

SOUTH LOUISIANA

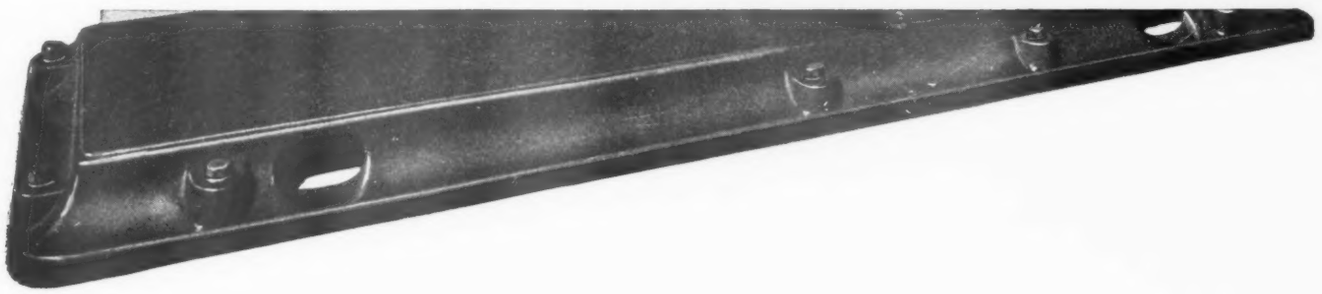
Company, Well and Location	Initial Production Bbls.	Depth
EVANGELINE—		
Port City Oil Co., Syndicate Fee Simple 10	100	1655

ARKANSAS

Company, Well and Location	Initial Production Bbls.	Depth
UNION COUNTY—		
Magna Prod. Co., El Dorado Realty Co. 1, 7-17-13	180	3091
Magnolia Pet. Co., Carroll 4, 1-17-14, wo	80	3019
Ohio Oil Co., C. B. Nash 3, Acct. 1, 6-17-13	1563	3020



Hercules Engines set new performance Standards



It is easy to understand why you see Hercules Engines hooked up to oil field equipment of recognized superiority. It is only because Hercules Engines themselves are recognized as superior power producers.

Everything you want in the way of satisfactory power you get from a Hercules Engine or Power Unit. Reliability — Endurance—Economy, because these qualities are built in by veteran experience in designing, manufacturing, and applying heavy-duty power.

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THE CONTINENTAL SUPPLY COMPANY
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Say you saw it in The OIL WEEKLY

EASTERN STATES

PENNSYLVANIA

Company, Well and Location	Initial Production Bbls.	Depth
BUTLER COUNTY—		
Phillips O. & G. Co., Pomry 1	400	....
GREENE COUNTY—		
Stonehouse O. & G. Co., Potts 1	¶2	....
BEAVER COUNTY—		
C. T. Andrews & Co., Ramsey 5	*	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
RITCHIE COUNTY—		
South Penn Oil Co., Wilson 15	4	....
Wilson 14	2	....
Michaels 1	*	....
Philadelphia Oil Co., A. Britton 1	*	....
Edward Lunch, Jackson 1	*	....
Park Bowser, Payne 2	¶3½	....
Big Four Drilling Co., Plum 1	¶½	....
CALHOUN COUNTY—		
Calhoun O. & G. Co., Andrews 1	5	....
W. H. Bickel, Shanks 1	¶1	....
J. M. Shanes 1	¶½	....
Hope Nat. Gas Co., Kelley 1	¶1	....
Johnson 2	¶2	....
Evan Starcher & Co., Hardman 1	¶1	....
L. B. Carroll, Barr 1	3	....
Silscott 4	¶1	....
South Penn Oil Co., Hamilton-Jarvis 1	4	....
Fleming & Goff, Smith 3	¶1½	....
F. F. McIntosh & Co., McCoy 2	¶1	....
ROANE COUNTY—		
South Penn Oil Co. Patterson Heirs 1	*	....
United Fuel Gas Co. Ferrell 1	¶1½	....
Clifton O. & G. Co., Summers 4	¶½	....
Owens Bottle Machine Co., Lincoln Land & Coal 11	¶1	....
Cameron O. & G. Co., Anderson 14	¶1	....
King O. & G. Co., Looney 1	¶1¼	....
Valley Gas Co., Perot 3	¶1¼	....
MARION COUNTY—		
South Penn Oil Co., Efaw 9	10	....
Continental Oil Co., Maadix 1	¶¼	....
Owens Bottle Machine Co., Barr 2	¶2	....
HARRISON COUNTY—		
Conservative Oil Co., Herbert 1	5	....
J. W. Johnson, Swiger 1	¶1¼	....
C. W. Perine, Lanhan 2	¶1½	....
GILMER COUNTY—		
A. E. Ellis & Co., Ellis 6	20	....
Chartiers Oil Co., Fitzpatrick 2	¶1	....
LEWIS COUNTY—		
Co-operative Oil Co., Harbert 1	5	....
WOOD COUNTY—		
F. G. Mixer, Clepplin 3	2	....
KANAWHA COUNTY—		
United Fuel Gas Co., Brown-Osborn 1	¶¼	....
MARSHALL COUNTY—		
Manufacturers Light & Heat Co., Cully 1	¶1½	....
MONONGALIA COUNTY—		
Carnegie Natural Gas Co., Waters 1	¶2	....
LINCOLN COUNTY—		
Cambridge Gas Co., King 1	..	....
WETZEL COUNTY—		
George Vaugh, Blair 1	*	....

KENTUCKY

Company, Well and Location	Initial Production Bbls.	Depth
OHIO COUNTY—		
Wood Oil Co., Inc., Mattox 3	40	....
Mattox 4	120	....
Jim C. Ellis, Gossett 8	75	....
Gossett 9	100	....
Cundiff 5	70	....
J. M. Meredith & Co., Kelley Heirs 7	40	438
C. Claypool & Co., Wade 2	10	....
George Slade & Co., Smith 1	5	....
Creek Drilling Co., Westerfield 2	*	604
D. J. White & Co., Howard 5	*	485
National Deposit Bank Co., Kelley 1	*	435
DAVIESS COUNTY—		
Huff & Calderwood, Salmon 1	35	....
French, Robbins & Co., Hinton 3	15	....
Creek Drilling Co., Hansford 1	*	....
WARREN COUNTY—		
P. H. Lavelle, Porter 3	20	1053
McGinley-Randall Supply Co., Seibert 2	7	431
Thompson Oil Co., McLemore 10	6	1057
ALLEN COUNTY—		
C. E. Thessen, Oliver 7	3	396
J. D. White, Williams 8	1	313
W. J. Stevens & Co., Willoughby 2	*	510
Lee Moore & Co., Williams 2	*	438
HANCOCK COUNTY—		
J. R. Poynter & Co., Gabbert 1	15	638
John Drake, Huff 2	10	....
Sears & Co., Baize 1	3	....
JOHNSON-MAGOFFIN COUNTIES—		
Hupp, Duff & Co., Bailey 3	20	....
Jesse Hare & Co., Vanderpool 2	8	....
Boston-Southwestern Oil & Gas Co., Conley 15	5	....
C. C. Bosworth, Borders 3	2	....
LAWRENCE-JOHNSON COUNTIES—		
Swiss Oil Corp., Sherm Lyons 4	¶½	....
Sherm Lyons 5	¶½	....
WOLFE COUNTY—		
Crit Childers, Childers 6	5	....
A. Girard, Kash No. 2 tr 1	*	....
Amp Burnett, Bush 5	2	....
LEE-OWSLEY COUNTIES—		
Petroleum Exploration Co., Gabbard 1	¶1	....
WAYNE COUNTY—		
Barrier Oil Co., Ramsey 16	2	....
ESTILL COUNTY—		
Superior Oil Corp., West & Co. 20	*	....
West & Co. 21	4	....
Henderson 27	2	....
Snowden & Co., Wallace 2	*	....

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
LICKING COUNTY—		
Emerald Petroleum, Little 1	40	2864
Whitehill Gas Co., Ashcraft 6	8	613
Ashcraft 3	6	636
Koontz & Shulty, Chaney 5	35	2899
Brown & Co., Chapin 10	5	....
Preston Oil Co., Morris 1	12	802
H. C. Farmer, Ashcraft 2	10	636
Wittmer O. & G. Co., Kidwell 1	¶1	2843
MEIGS COUNTY—		
Logan Gas Co., Warner 2	*	1581
Ohio Fuel Gas Co., Stobbart 1	4	1783
Pure Oil Co., Holter 3	10	784
Tyree & Co., Carnahan 6	30	590
Holter 1	5	1868
E. Edwards & Co., Chaney 2	3	1643
ATHENS COUNTY—		
Logan Gas Co., Snodgrass 2	¶½	915
Chapman 3	*	1676
Frank Selby, Selby 14	¶¼	1468
Charles Fox, Goddard 1	*	272
HOCKING COUNTY—		
Adair & Donaldson, Donaldson 5	98	2933
Kachelmacher Estate, Carson 1	5	3250
Nash & Co., Albert 1	*	3004
KNOX COUNTY—		
Jameson & Leightner, Davidson 2	3	764
Ohio Fuel Gas Co., Hasting 1	¶¼	3399
Newark Tool Co., Davidson 1	5	....
HOLMES COUNTY—		
Ohio Fuel Gas Co., Smith 1	5	....
Preston Oil Co., D. Nethrow 7	10	....
WAYNE COUNTY—		
Ohio Fuel Gas Co., Landis 1	¶1¾	....
Harmon & George, Taylor 2	¶1	....
ASHLAND COUNTY—		
Ohio Fuel Gas Co., Helbert 1	¶1¾	....
Weisman 1	¶½	....
LORAIN COUNTY—		
Ohio Fuel Gas Co., Mole 1	*	....
Novak 1	*	....
MUSKINGUM COUNTY—		
Hope Construction & Refg. Co., Helphrey 2	257	3162
GALLIA COUNTY—		
Holstead & Kenney, John Brothers 1	3	1596
SUMMITT COUNTY—		
F. A. Brendall & Co., Serfass 1	¶5½	4000
PERRY COUNTY—		
Ohio Fuel Gas Co., Kinman 1	*	....
STARK COUNTY—		
Johnson & Stolz, Hurford 1	*	4000
RICHLAND COUNTY—		
Logan Gas Co., Stout 1	*	....
JACKSON COUNTY—		
Ohio Fuel Gas Co., Deckard 1	*	2649

INDIANA

Company, Well and Location	Initial Production Bbls.	Depth
VIGO COUNTY—		
Siosi Oil Corp., Riggs No. 2, tr 6	15	2192
Williams 5	15	2205
GIBSON COUNTY—		
Rogers & Randall, Williams 1	40	1335
ADAMS COUNTY—		
Wm. Kelly & Co., Stanley 3	5	....
PIKE COUNTY—		
Gem Oil Corp., Yeager 4	¶5	....

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
WASHINGTON COUNTY—		
Ohio Fuel Gas Co., Welch 1	50	580
Preston Oil Co., Wynn 2	¶¼	1175
Dinsmoor Bros., Rowland 1	¶½	1160
Gibson & Son, Van Wormer 2	¶1½	1143
Friendship Oil Co., Edmonds 1	6	....
J. B. Draper Oil & Gas Co., Cooper 1	*	....
NOBLE COUNTY—		
Ohio Fuel Gas Co., Johnson 3	¶¼	1327
Herszler O. & G. Co., Heisel 2	1	763
Barry, Rich & Co., McLaughlin 10	4	....
Myra S. Lee, Maginnis 1	3	....
L. A. Patton, Davis 3	3	....
MORGAN COUNTY—		
Ohio Fuel Gas Co., Hopkins 4	¶1	1597
Morgan Oil & Gas Co., Ball 2	¶¼	1564
MONROE COUNTY—		
Roy Decker & Co., Burkhart 4	*	572
HARRISON COUNTY—		
Worthy Rine & Co., Mercer 1	*	1646

NORTHWESTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
HANCOCK COUNTY—		
Bear Tooth Oil Co., Watson 1	16	....

ILLINOIS

Company, Well and Location	Initial Production Bbls.	Depth
WABASH COUNTY—		
Ramsey Oil Co., Ramsey 1	30	1585
J. S. Young & Co., Price 2	*	1583
Adams Corner Oil Co., Leek 2	*	1520
LAWRENCE COUNTY—		
Ohio Oil Co., Meffor 5	5	1672
Green 5	2	1654
CRAWFORD COUNTY—		
J. F. Bolinger & Co., Evans 2	5	958

MICHIGAN

Company, Well and Location	Initial Production Bbls.	Depth
MUSKEGON COUNTY—		
Muskegon Dev. Co., Zuidema 2	600	2050
Muskegon-Ottawa-Davis Co., Reeths 1	¶7½ 500	2069
Diamon O. & G. Co., North Muskegon Dev. Co. 1	250	....
Reed Oil Co., Young 1	50	....
Dixie Oil Co., Figge 9	25	....
Dirkes 1	30	....
MONROE COUNTY—		
Deerfield O. & G. Co., Roe 1	30	2100
Gaertner 1	30	2050

CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
BUENA VISTA—		
Standard Oil Co., No. G-53	200	4710
LONG BEACH—		
Shell Co., Hutton 8	1000	7500
Hutton 9	800	7475
SANTA FE SPRINGS—		
Bellview Oil Co., Gros 2,	3100	6030
Universal Consolidated Oil Co., O'Donnell 3	6100	5785
SEAL BEACH—		
Marland Oil Co., Bixby 25	1500	4775
RICHFIELD—		
Union Oil Co., A. P. 4	*	3355
VENTURA—		
Shell Co., Gosnell 27	700	7120

NORTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
BIENVILLE PARISH—		
Baca Drilling Co., State 1, 16-16-10	*	2561
Northwest La. Gas Co., Pinewoods Lbr. Co. 17, 33-23-11	35	3041
BOSSIER PARISH—		
Barrett & Morgan, Murff 1, 16-17-11	*	2516
OUACHITA PARISH—		
Ark. Nat. Gas Corp., Potts 1, 30-19-4e	¶2-7	2186
RICHLAND PARISH—		
Magnolia Pet. Co., M. L. McCoy 1, 29-16-6e	¶20	2450
SABINE PARISH—		
R. L. Gay, Trustee, Bowman-Hicks 2, 14-7-14	50	2130
WEBSTER PARISH—		
Northwest La. Gas Co., Pinewoods Lbr. Co. 8, 37-23-11	*	3418
Superior Oil Co., McCook & Hibbler 1, 21-21-10	¶25	4679

Time-Tried and Tested
Powell Valves

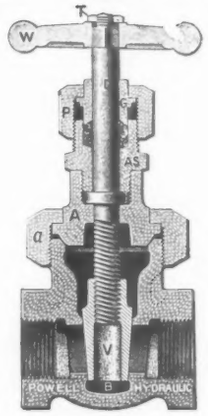

FIG. 178—S.E.
Bronze Hydraulic Gate Valve.
2,000 pounds W.W.P.
Sizes ½ to 3 inches.

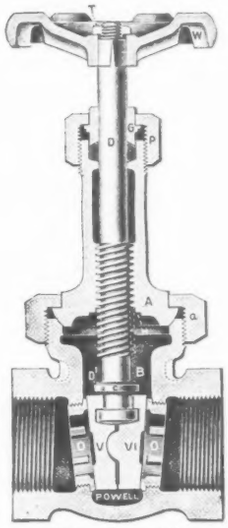

FIG. 375—S.E.
Bronze White Star Gate Valve.
200 pounds W.S.P. and X.
Hvy for 300 pounds W.S.P.
Sizes ¼ to 3 inches.

POWELL Valves in design, construction, and service have taken the same place in the oil fields as other Powell Products have taken as standards in engineering and industrial practice for 82 years.

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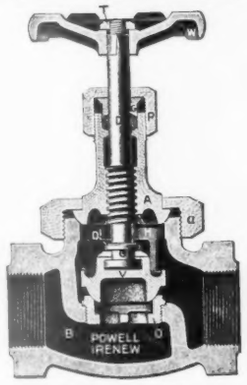

FIG. 190—S.E.
Iron Body Irenew Globe Valve.
150 pounds W.S.P. and X.
Hvy for 300 pounds W.S.P.
Sizes ¼ to 3 inches.

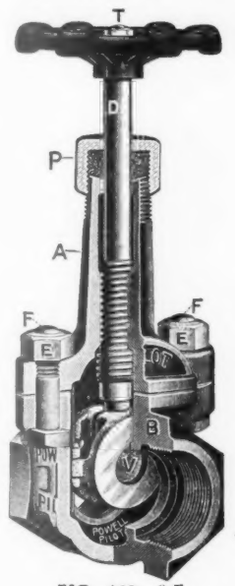

FIG. 460—S.E.
Iron Body Pilot Gate Valve.
125 pounds W.S.P.
Sizes ¼ to 3 inches.

Republic Supply Company

General Office Houston, Texas

OIL AND GAS WELL SUPPLIES
ROTARY AND CABLE TOOLS

TEXAS

TEXAS GULF COAST

Company, Well and Location	Initial Production Bbls.	Depth
BIG CREEK—		
Gulf, T. W. Davis 14 wo	1500	3360
BLUE RIDGE —		
Dudley S. Golding, Overly 4	25	2140
GOOSE CREEK—		
Gulf, Tabb A-17	35	3020
HIGH ISLAND—		
McLean Oil Co., Cade 12, wo	1560	4350
HULL—		
Gulf, Phoenix Dev. Co. 50, wo	40	3400
Phoenix Dev. Co. 23, wo	*	2850
Republic Prod. Co., Dolbear 106, wo	70	2430
PIERCE JUNCTION—		
Rio Bravo Oil Co., Settegast 9	*	5910
Settegast B-10	2500	3580
SOUTH LIBERTY—		
The Texas Co., Staiti 13	160	890
Staiti 15	150	870

EAST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
PANOLA COUNTY—		
Natural Gas Prod. Co., Tom Moore 2, Jordan sur	¶6	2695

SOUTHWEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
SALT FLAT—		
Shell Pet. Corp., Smith 1	600	2682
Smith 2	1200	2702
Atlantic Oil Producing Co., Davis A-1	130	2834
Gulf Prod. Co., Davis 1	100	2743
Sun Oil Co., Merriweather 2	1300	2552
WEBB COUNTY—		
O. W. Killam, Bruni 28, Albercas Field	300	2205
Sun Oil Co., Yeager-Strotham A-8, Share 5, Las Animas Grant	250	2165
Cole Pet. Co., Benavides 65, blk 4, sur 412	70	2340
Suladie-Mims Oil Co., Puig 1, Aviator pool	*	1860
Serna-Forrest, Benavides 1, blk 2, sur 2272	*	3100
JIM HOGG COUNTY—		
Randado Oil Corp., Palacios 26, blk 19, sur 291	75	1277
Alworth, Stevens & Hild, Garza 14, blk 8, sur 39	*	1017
ZAPATA COUNTY—		
O. W. Killam, Cuellar 5, Jennings field	60	1470
Cuellar 7	100	1472

TEXAS PANHANDLE

Company, Well and Location	Initial Production Bbls.	Depth
GRAY COUNTY—		
Gulf Prod. Co.'s Holmes 3	120	3152
Lefors Pet. Co., Shaw 4	*	1810
Magnolia Pet. Co., R. Harrah 2	35	3255
R. R. Osborn et al, E. E. Barrett 1	*	3345
The Shamrock Oil Co., W. S. Clayton 1	¶5-50	2822
The Texas Co., M. B. Davis 3	*	3285
HUTCHINSON COUNTY—		
Phillips Pet. Co., Whittenburg-Elra 12	*	5333
White Eagle O. & R. Co., Johnson-Montgomery 4	50	2936
WHEELER COUNTY—		
Lone Star Gas Co., M. Ackley 1	¶51	1947

CENTRAL WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
BROWN COUNTY—		
Anderson et al, Williams 1	*	1460
Armstrong et al, Armstrong 1	*	1455
Bruce et al, Shields 3	*	521
Bierman & Barbara Oil Co., Miller 2	45	1105
Crabb-McNeil & Stout, Moore 1	*	615
Cranfill & Reynolds, Hickman 1	*	1325
Hammon & Garrett, Lewis 5-A	10	1078
Lloyd et al, Bailey 1	*	437
Olvey & Robbins, Nash 1	*	1330
Ramsey et al, Wooldridge 1	*	1278
Stewart et al, McGarfity 1	4	1631
Young Bros.-Alexander & Woodley Pet. Co., Hickman 15	30	1279
CALLAHAN COUNTY—		
Holmes et al, Hickman 1	15	455
COLEMAN COUNTY—		
Byrd & Goldston, Moody 3	10	1865
Jamison & Pollard, Hinds 1	*	2250
Morrison & St. John, Eddington 1	¶4½	1125
EASTLAND COUNTY—		
Hoffman & Page, Coon 1	15	1280
Lewis et al, Johnson 1, Lot 14	*	1800
T. P. Coal & Oil Co., P. O. Ranch Fee 2	*	830
ERATH COUNTY—		
Peters et al, Barton 1	*	3525
McCULLOCH COUNTY—		
Lanning et al, Barton 2	*	1031
SHACKELFORD COUNTY—		
Cranfill & Reynolds, Flippen 1-B	50	898
James et al, Earhart 1	*	1265
Roeser-Pendleton-Marland, Cook 84-A (Sec. 60)	40	1179
Cook 27-A, (Sec. 61)	50	1370
STEPHENS COUNTY—		
Clark et al, Jackson 1	10	2165
T. P. Coal & Oil Co., E. A. Hancock 2,	7½	3641

NORTH TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
ARCHER COUNTY—		
Ascot Co., Jackson 1	*	1822
F. C. Grebin et al, Hennig	100	1432
Harry Hines et al, Wilson 1, Blk 31	*	1660
J. H. Johnston et al, Jackson 1	*	1603
Pandem Oil Corp., Wilson 1	*	1402
J. B. Peacock et al, Mrs. G. Williams 1	95	573
Shaster Oil Co., Meade 1	*	1471
The Texas Co., Hill 21	85	1422
Hayter 10	10	1438
Jim Turner et al, Lyles 2	80	1697
BURKBURNETT—		
T. J. Cotton et al, Michie 2	*	870
COOKE COUNTY—		
C. M. Beckner et al, Fields-Bowers 1	*	1514
W. L. Griffie et al, Wheelock 1	12	1332
Kewanee O. & G. Co., Timms 3-A	85	1204
ELECTRA—		
Bridwell & Heydrick, Burnett 3	*	2502
W. H. Hammon et al, McCarty 11-C	50	1353
McCarty 6-D	50	1360
Mrs. R. A. Laning et al, McCarty 7, Lse. No. 3	80	1363
HARDEMAN COUNTY—		
The Texas Co., Clisbee 1	*	4310
JACK COUNTY—		
Bryson O. & G. Co., O. Loving 1	100	3168
B. Bryson et al, Thomason 1	*	2600
Buttram Pet. Corp., Jones 10	60	2043
T. G. Shaw Interests, Nichols 1	*	3680
K-M-A AND IOWA PARK—		
Carl B. Bailey et al, Munger 27	10	1768
Coleman & Coppock, K. & K. 12	50	1204
Holbrook & Wood, Kemp-Kempner 26	650	1494
W. B. Omohundro et al, Pace 20	*	1800
Staley-Wynne et al, K. & K. 5	300	1489
MONTAGUE COUNTY—		
Bridwell Oil Co., Salmon 6-A	25	1636
Salmon 7-A	30	1187
Continental Oil Co., Jones 4-A	15	785
THROCKMORTON COUNTY—		
Jones et al, Wilhelm 1	*	752
WILBARGER COUNTY—		
Baker et al, Waggoner 8-B	250	1893
Barkley & Meadows, Waggoner 7-C	125	1880
Consolidated Oil Co., Waggoner 1-K	*	1980
Cosden & Co., Waggoner 29-B	120	2320
Fain-McGaha Oil Corp., Waggoner 20-S	250	2421
Phillips Pet. Co., Waggoner-Best 1	*	2518
Waggoner 20-NN	65	2367
Robertson et al, Waggoner 1-E	*	2424
Simms Oil Co., Waggoner 8	145	1881
Staley-Wynne et al, Waggoner 3-F	400	2421
Waggoner Ref. Co., Waggoner 5-I	700	2410
YOUNG COUNTY—		
Burns et al, Stewart 1	*	854
Clark et al, Rushing 1	*	900
R. L. Eckerty et al, Clark 1	*	1003
King Royalty Interest, Hawkins 12	25	529
Lynch & Whitehill, Johnson 3	7	527
Mook-Texas Oil Co., Davis 11	*	805
Petroleum Prod. Co., Jackson 1	*	1490
Parrish 1-D	20	1106
Prairie O. & G. Co., Kunkel 4	15	1160
Prairie et al, Campbell 4	70	988
Riggs et al, Sweet 6	10	566
Sweet 7	15	566
Scott et al, Alexander 1	*	503
Williams et al, Casey 2	*	605
Wootten & Reed, Horton 1	*	751

WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
HOWARD COUNTY—		
Dunigan & Hyer, Clay 3	85	1816
Superior Oil Corp., Roberts 5-B	1480	2961
Magnolia Pet. Co., Roberts 15	*	3114
Marland Prod. Co., Chalk 4-E	250	1784
Merrick & Lamb, Clay 6	65	1890
JONES COUNTY—		
The Texas Co. & Cosden & Co., Camp 1	60	2541
PECOS COUNTY—		
The California Co., Smith 4, Lse. No. 1	1825	1860
UPTON COUNTY—		
Champlin Ref. Co., Lane 4	55	1979
Keck Investment Co., McClintic 1	200	2944
WINKLER COUNTY—		
Marland Prod. Co., Hendrick 2-A	100	3138
May Prod. Co., Hendrick 1	50	2920
Prairie O. & G. Co., Cowden 2	25,000	2960
Pure Oil Co., Hendrick 9-C	15,000	2566
Hendrick 10-C	20,000	2618
Shell Pet. Corp., Hendrick 7-F	300	3080
Southern Crude & Dixie Oil Co., Hendrick 2-B-3-T-68	550	3000
Ida Hendrick 3-B-T-67	525	3038
Southern & R. A. Westbrook, Hendrick 6-I-T-88	600	2950
Hendrick 3-B-T-88	14,400	2950
Hendrick 4-T-T-88	100	3210

Hearing on Crude Tariff Comes in February

Washington, D. C.—Imposition of a duty of $1 per barrel on all crude oil imported into the United States, proposed by Representative Howard of Oklahoma, will be considered by the House Committee on Ways and Means when it reaches the free list, probably around February 20. Hearings on proposed changes in the tariff law will begin January 7 and will continue for approximately two months, with a view to having a tariff bill ready for introduction at the beginning of the next session of Congress.

Crude oil has always been on the free list, but efforts have been made in recent years to secure the imposition of a duty, agitation to that effect in 1921 and 1922 being unsuccessful. In introducing his bill seeking the imposition of the $1 duty, Representative Howard pointed to the great volume of oil which is being imported into the country while, at the same time, domestic production is at a height never before reached.

At the same time, it has been pointed out, the output of oil in the United States has increased from some 550,000,000 barrels in 1922 to probably in excess of 900,000,000 barrels this year, while in the same period imports declined from 127,000,000 barrels to about 58,000,000 last year.

The subcommittee of the House ways and means committee which will be in charge of the free list is composed of Representatives Richard S. Aldrich of Rhode Island, chairman, Charles L. Faust of Missouri and Lindley H. Hadley of Washington.

"Build Strong"

Just lately the manufacturers of TRANSIT PUMPS have been recalling that in the old days when they were building equipment for the Standard Oil Company only, the admonition was to "Build Strong," and that after twenty-five or thirty-five years of service many of those old pumps are still going strong. We want to add this tribute: The TRANSIT idea of strength has never run to unnecessary bulk and weight, but to extraordinarily fine materials and great craftsmanship. Thus in TRANSIT lines you find the perfect pump for any given job.

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Sucker Rods, Pull Rods, Plunger Working Barrels (Pumps) etc.

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Oil Contry Boilers and Tanks

Frick-Reid Service Belting
Rubber Covered and Friction Surface.

National Transit Pump and Machine Co.
Power and Steam Pumps.

J. P. Ratigan
Grips, Clamps, Beam Hangers.

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Gas and Oil Engines, two and four-cycle, Band Wheel and Direct Drive Pumping Powers.

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Manila Cordage, including Frick-Reid Manila Bull Ropes—same quality for ten years.

Jones & Laughlin Steel Corp.
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Valves, Fittings and Tools for Steam, Water, Gas, Oil and Air.

Rossendale-Reddaway Company
"Camel Hair" Beltings, Belt Clamps.

Engineering Crews
for the installation of Pumping Powers and related equipment.

PERMITS GRANTED FOR NEW WELLS

WEEKLY COMPARISON OF NEW WELLS

Following is a condensed table giving a comparison of permits or locations made for new wells during the past year in Kansas, Oklahoma, Arkansas, Louisiana, Texas, California and the Mountain States:

	Week ending Dec. 8	Previous week	Total this month	Total this year	This week last year	This month 1927	Total same date 1927	Year total 1927
Arkansas	8	6	14	321	12	16	320	329
California	13	26	39	1,134	30	66	1,138	1,226
Louisiana	10	22	32	650	20	38	779	812
Kansas	12	20	32	989	22	40	909	972
Oklahoma	84	71	155	3,504	71	126	3,533	3,702
Texas	198	175	373	7,767	195	334	8,329	8,665
Mt. States	..	..	..	..	..	..	431	494
Total	325	320	645	14,363	350	620	15,439	16,149

ARKANSAS

BRADLEY COUNTY—Ohio Oil Co., Sou-Lbr. Co. 2, 330 ft n and e center section 19-16-9.

NEVADA COUNTY—Humble O. & R. Co., E. W. Grove D-2, 1650 ft n and e of center of 6-14-20.

OUACHITA COUNTY—J. E. Crosbie, H. Primm 3, 480 ft w and 300 ft s nec sw sw 34-15-16.

UNION COUNTY—Lion O. R. Co., Nash 2, 660 ft s and 330 ft w of nec ne sw, 6-17-13. Ohio Oil Co., J. S. Alphin 2, nec nw nw, 7-17-13; Nash 4, Acct. 1, swc se sw, 6-17-13; Nash 1, Acct. 3, swc nw se, 6-17-13; L. L. Ward 1, nec ne se 15-17-14.

LOUISIANA

ASCENSION PARISH—Big Dome Drlg. & Dev. Co. & J. S. Kimbrough, New Orleans, Rearwood 1, 82-10s-2e, beginning se cor sec. 17, thence w 17.87 chains s 59.65 ft. thence e 300 ft in Sec. 82.

CALCASIEU PARISH—Union Sulphur Co., Sulphur, Fee 740, 29-9s-10w, 133 ft n and 1437 ft w of center of Sec. Vacuum Oil Co., Houston, Bayou D'Inde State 5, 9-10s-9w, 950 ft s and 300 ft w of nec sw nw.

CAMERON PARISH — Cameron Oil Co., Inc., Vinton, Benson Vincent 1, 29-12s-10w, 810 ft n and 150 ft w of se c sw se. Pure Oil Co., Fort Worth, Yount-Lee Oil Co. 8, 12-13s-8w, 2190 ft e and 3290 ft s of nwc.

IBERIA PARISH — Gulf Ref. Co. of La., Houston, La. State Z-8, 26-11s-8e, 6094 ft e and 59.9 ft s of center of Sec. 26-11s-8e in Lake Fausse Pointe.

IBERVILLE PARISH—Standard Oil Co. of La., Shreveport, A. Wilbert & Sons Lbr. Co. 2, 74-9s-10e, 1712 ft n and 500 ft w of sec sw se.

MOREHOUSE PARISH—Amalgamated Co., Monroe, Fairly 3, 53-20n-4e, 660 ft n and 3910 ft w of sec Sec. 13 in Sec. 53. Natural Gas Prod. Co. of La., Bastrop, Crossett Lbr. Co. 22, 35-21n-4e, 3960 ft s and 1320 ft e of nwc.

RICHLAND PARISH—Magnolia Pet. Co., Shreveport, J. M. Sartor et al 1, 21-16n-6e, 630 ft s and 630 ft e of nwc ne nw.

OKLAHOMA

CADDO COUNTY — Magnolia Pet. Co.'s Moss 3, ne nw sw, 5-5n-9w, owdd.

CARTER COUNTY — Magnolia Pet. Co.'s Archer 1, se sw nw, 14-1s-3w.

COMANCHE COUNTY — Magnolia Pet. Co.'s Price 5, ne se sw ne, 30-2n-9w, owdd.

COTTON COUNTY—Shasta Oil Co.'s Indian 1, ne cor 34-1s-11w; Razor & Akins, Chambers 1, nw se sw, 31-1s-10w.

CREEK COUNTY—A. J. Spears, Glenn 9, nw ne ne nw, 11-17-12e. D. W. Franchot et al, Ralston 1, sw se nw, 16-16-10e. Kessler & Logan, Morton 2, se ne nw, 27-14-10e. Twin State Oil Co., Coachman 7, se nw ne, 20-17-7e.

GRADY COUNTY—Magnolia Pet. Co., Skirvin-Farwell 9, nw se, 23-5n-8w. The Texas Co., Glover 5, cnl se ne sw, 13-4n-8w.

HUGHES COUNTY—Twin State Oil Co., Harjo 1, nw ne se, 8-8-9e.

KAY COUNTY—Carter Oil Co. & Ona Oil Co., Shimp 9, cel w/2 sw sw, 17-29-1e. Carter Oil Co., Carter Shimp 1, c nw nw, 20-29-1e. D. J. Wilson, Meuret 2, c se ne, 14-27-1e, Ingram & Wilson, Wilie Grube 1, sw ne ne nw, 23-27-1e.

KIOWA COUNTY—Conner & Son, Zacharias 1, sw nw nw, 25-7n-16w. Bridwell et al, Stone 1, se ne, 12-6n-17w, owdd. Burke et al, Fox 1, ne nw se, 5-6n-16w.

LOGAN COUNTY—Blackwell O. & G. Co., Quigley 2, ne se nw, 28-18-4w.

McCLAIN COUNTY — Mid-Continent Pet. Corp., No. 1, se cor, 22-5-3e.

MUSKOGEE COUNTY — H. E. Williams, Roberts 1, cel sw sw, 9-15-17e. Decius & Garrett, Collins 1, nw sw ne, 18-14-18e. C. H. Loweree, Brown 3, cnl nw se, 5-13-16e.

OKFUSKEE COUNTY — W. L. Umburn, Simmer 7, cnl ne se, 11-10-11e.

OKMULGEE COUNTY—Unger Bros., Harrison 7, se sw, 24-15-14e. H. L. Jolly et al, Serrell 1, se sw 33-15-14e, owdd. Taylor & Geiger, Smith 1, sw cor, 36-14-14e. W. B. Pine, Henry 1, owdd, se ne n.e, 3-12-13e. Kim Oil Co., Perryman 1, nw sw, 25-12-12e. F. Hyer et al, Howard 1, ne se se, 17-15-14e.

OSAGE COUNTY—Lewis Prod. Co. et al, No. 1, sw cor, 14-26-6e. The Texas Co., No. 5, sw no se, 30-25-8e. A. G. Oliphant et al, No. 1, nw ne, 6-21-9e. Peters & Edgewood et al, No. 2, se ne se. 8-21-9e. Peters et al No. 3, ne se se se, 8121-9e. Clint Moore Estate No. 19, nw sw nw sw, 9-21-9e. Clint Moore Estate No. 20, nw se sw sw, 9-21-9e.

PAYNE COUNTY — Twin State Oil Co., Goff 2, sw ne sw, 7-18-5e.

PITTSBURGH COUNTY—Kerr & Key, Tall 1, c nw nw, 32-4n-12e.

PONTOTOC COUNTY — Wilcox O. & G. Co., Bowlin 1, ne sw sw, 13-4n-7e. Wilcox O. & G. Co. No. 1, se ne ne, 14-4n-7e. American O. & R. Co., Jones 2, se ne ne, 18-5-5e. W. R. Ramsey, Whitney 4, ne se nw, 19-5-8e. W. R. Ramsey, Webb 4, owdd, nw sw sw, 20-5-8e. Sinclair O. & G. Co., & J. A. Hull, Gardner 1, nw se, 6-4-6e.

POTTAWATOMIE COUNTY — Magnolia Pet. Co., C. Youts 4, sw ne sw, 20-7-5e; Youts 3, nw se sw, 20-7-5e. Gypsy Oil Co. et al, S. Guinn 1, ne se nw, 9-7-5e; Miller 3, se ne se, 18-8-5e. Magnolia Pet. Co., Billington 4, nw se sw, 8-8-5e; Billington 3, sw ne sw, 8-8-5e. Twin State Oil Co., Colin 2, nw sw, 7-8-5e. The Texas Co., Calvin 4, ne nw se, 7-8-5e. Amerada Pet. Corp. & Marland Oil Co., Calvin 2, sw nw, 7-8-5e. Sinclair O. & G. Co., Lewis 2, sw cor, 6-8-5e. Tidal Oil Co., Dunn 3, se ne, 12-8-4e. Mid-Continent Pet. Corp., Rogers 2, sw se sw, 5-9-5e.

SEMINOLE COUNTY — The Texas Co., Lucy 6, se sw se, 18-5-8e. Sinclair O. & G. Co., Joana 1, ne nw, 24-5-7e. T. B. Slick, Fleet 1, se cor, 11-5-7e. McCulloch et al, Lincoln 1, se nw, 16-10-6e. Carter Oil Co., et al, Strothers 1, se sw nw, 11-9-6e. Carter Oil Co., Davis 3, se sw nw, 13-9-5e. Carter Oil Co. et al, Gillim 1, nw se, 13-9-5e. Magnolia Pet. Co., Gillim 2, ne sw, 13-9-5e. Magnolia Pet. Co., Hyde 3, sw se nw, 13-9-5e. Magnolia Pet. Co., Hyde 4, se nw, 13-9-5e. Gypsy Oil Co., Fife 2, nw sw nw, 14-8-5e. Carter Oil Co., Factor 1, se nw, 26-7-6e.

STEPHENS COUNTY—Roy Carter et al, Simpson 1, ne se se se, 34-1s-8w. Roy Carter, Simpson 6, nw sw sw se, 34-1s-8w. Pace et al, Bush 4, nw ne ne nw, 3-2s-8w. Pace et al Bristowe "A" 10, sw nw ne, 18-2s-7w. Magnolia Pet. Co., School 1, sw se, 13-1s-9w. Lone Eagle Oil Co., Sompson 7, ne sw ne se, 34-1s-8w. Magnolia Pet. Co., Kagay 19, ne se se sw, 34-1s-8w. Pelwin Oil Co., Baker 1, sw ne nw, 36-2s-6w. Wirt Franklin Pet. Corp., Bell 2, ne sw sw, 12-1s-4w.

TULSA COUNTY—Munn Bros., Wray 2, cwl sw nw, 35-19-13e.

WAGONER COUNTY — McCracken et al, Childers 5, se ne, 21-18-17e. McCracken et al, Childers 6, ne se, 21-18-17e. Horner et al Kidd 1, csl nw nw, 22-18-17e.

WOODS COUNTY—Sinclair O. & G. Co., No. 1, c sw sw, 33-27-16w.

KANSAS

BUTLER COUNTY—Empire O. & R. Co., Huston 15, ne sw sw, 19-26-5e. Henderson & Holden, Morgan 2, sw se, 14-27-5e.

ELLIS COUNTY—Hartman & Skaer, Knoll 1, ne nw, 17--13-18w. Davis & Hazlett, Weiland 1, ne cor, 1-13-16w.

GREENWOOD COUNTY — Dorsey & Obrien, Obrien 1, ne sw, 12-27-9e. W. H. Nelson, Claycomb 1, se sw nw, 6-25-9e.

HARVEY COUNTY—Margaret Gay Oil Co., Groue 1, nw ne nw, 29-23-1w.

McPHERSON COUNTY—Mid Kansas O. & G. Co., Yoder 1, c nw sw, 34-2-19w.

RUSH COUNTY—Danciger O. & R. Co., Pinonka 1, c ne, 17-19-17w.

SEDGEWICK COUNTY—Shell Pet. Corp., Lyglisse 1, se ne, 15-26-2e. McCulloch Oil Co., Thurley 1, ne sw ne, 24-29-1e.

SUMNER COUNTY—De Forrest Oil Co., Frantz 3, c nw ne, 35-30-2w.

CALIFORNIA

BELRIDGE—Union Oil Co., King 5, 30-28-21.

BREA-OLINDA—Fullerton Oil Co., No. 24, 2-3-10.

LONG BEACH—Dabney-Johnston Oil Corp., No. 23, 24-4-13; No. 24, 24-4-13; No. 25, 24-4-13; No. 26, 24-4-13. Magnet Oil Co., No. 1, 24-4-13. Shell Co., Nesa 11, 29-4-12. Western Oil and Refining Co., Noll 2, 24-4-13.

MIDWAY—Honolulu Consolidated Oil Co.'s 1, 8-32-24.

MT. POSO—Petroleum Securities Co.'s Glide 7, 21-27-28.

SANTA CLARA—Carl Crossen's 1, 9-8-1.

VENTURA—Shell Co.'s Taylor 35, 28-3-23; Gosnell 32, 28-3-23.

TEXAS

ARCHER COUNTY—American Ref. Properties & Corlett & White, Wichita Falls, Cernosek 4, 2409, T.E.&L. sur, 319 ft w of No. 3. E. G. Christie, Olney, Phillips 1, Blk. 6, B.B.B.&C. sur, 150 ft of center of w line. J. H. Turner, Iowa Park, Lyles 2, Sec. 7, 750 ft from n and 321 ft from e line. T. Y. Pickett, Wichita Falls, Williams 1, J. Hand sur, 1050 ft from e and 150 ft from s line. L. T. Burns, Wichita Falls, McCrory 1K, B 70, Amer. Trib. sur, 750 ft from s and 450 ft from w line. Texas Co., Wichita Falls, Montgomery 1, Club Ranch sur, 750 ft from w and 450 ft from s line. Gulf Prod. Co., Fort Worth, Hayter A 7, 2409, T.E.&L. sur, 315 ft s of No. 6; Wilson L 1, S 114, Amer. Trib. sur, 150 ft from s and e lines. C. E. Littlefield, Wichita Falls, Gant 1, N. A. Simmons sur, 751 ft from e and 150 ft from s line. A. Minnich, Archer City, Wilson 2, J. Scott sur, 968 ft from n and 400 ft from e line. Jeffers & Jeffers, Wichita Falls, Wilson 1, Amer. Trib. sur, 150 ft from s and e lines. Texas Co., Wichita Falls, Hill 11, 2408, T.E.&L. sur, 150 ft from

n and 1728 ft from w line. Perry Browning, Wichita Falls, Fee 1, 76, T.E.&L. sur, 150 ft from w and 750 ft from s line. Texas Co., Wichita Falls, Hill 22, 2408, T.E.&L. sur, 300 ft w of No. 21; Richardson 23, S. A. R. sur, 300 ft w of No. 19. Madden & Hunt, Olney, Richardson 12, B 7, S. Anderson sur, 300 ft w of No. 8. Reno Oil Co., Wichita Falls, Parrish 5, S. 2 S., 300 ft s of No. 3. L. T. Burns, Wichita Falls, Forster 1, B 47, Club Ranch sur, 1124 ft from w and 150 ft from s line. Bass & Dillard, Wichita Falls, Perkins 5, D. C. S. L. sur, 330 ft w of No. 1. T. F. Hunter, Wichita Falls, Krebbs 1, A. Nail sur, 1200 ft s of center of n line. Johnson & Fraser, Wichita Falls, Wilson B10, B 35, Geraldine sur, 300 ft w of No. 5.

ANDERSON COUNTY—Humble O. & R. Co., Houston, Coleman 1, A. C. Bullock sur, 594 ft from n and 406 ft from w line; Todd 1, D. Roberts sur, 950 ft from w and 800 ft from n line. J. S. Cosden, Inc., Fort Worth, Douglas 2, I. Simpson sur, 150 ft from s and e lines.

BROWN COUNTY—Shallow Sand Oil Co., Fort Worth, Shelton 6, Batton & Camp sur, 300 ft w of No. 5; Shelton 7, 300 ft w of No. 6. Lloyd Oil Corp., Fort Worth, Bailey 1, S 137, J. Winn sur, 150 ft from n and e lines. Amerada Pet. Corp., Fort Worth, Wise 3, No. 13, J. M. Clark sur, 600 ft w of No. 2. Cranfill & Reynolds, Cisco, Hickman 1, No. 783, T. Benson sur, 880 ft n and 150 ft from e line. Kone Prod. Co., Cisco, Hickman A20, No. 783, T. Benson sur, 550 ft from n and w lines; Hickman A21, 815 ft e of No. A20. C. M. Root, Eastland, Robertson 1, S 3, S.A.&M.G. sur, 150 ft from n and e lines. Mook-Texas Oil Co., Fort Worth, Newton 3, No. 149, W. B. Travis sur, 200 ft from n and e lines. L. C. Riordan et al, Brownwood, Pugh 1, C. B. Jennings sur, 150 ft from s and e lines. G. P. Mitcham, Cisco, Newton 1, No. 623, R. Honeycutt sur, 150 ft n and 450 ft from e line. Humble O. & R. Co., Cisco, Hickman 27, No. 783, T. Benson sur, 470 ft w of No. 18. Lloyd Oil Corp., Fort Worth, Collier 12, S 139, W. A. Smith sur, 300 ft s of No. 6.

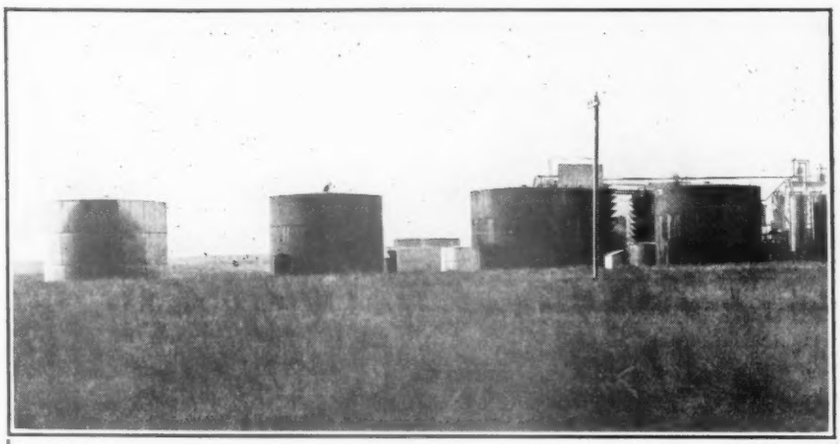
BASTROP COUNTY—Cranfill & Reynolds, Cisco, Yost 3, Garcia & Cunningham sur, 300 ft se of No. 1.

BEXAR COUNTY—Gas Ridge Dev. Co., San Antonio, Kennon 10, No. 4, F. Rodriguez sur, 2500 ft from e and 480 ft from s line. Dingman Oil Corp., San Antonio, Feldman 1, Wm. Small sur, 151 ft from n and 1260 ft from e line.

CALLAHAN COUNTY—L. M. Patterson, Moran, Anthony 1, S 56, L.A.L. sur, 375 ft from n and 750 ft from w line Texas Co., Wichita Falls, Hatchett 11, S 29, D.&D. Asy. sur, 30 ft s of No. 5. J. F. Mason, Fort Worth, Ogle 8M, 2974, T.E.&L. sur, 210 ft ne of No. 20. Texas Co., Wichita Falls, Hatchell 11, S 29, D.&D. Asy. sur, 300 ft s of No. 9. Prairie O. & G. Co., Ranger, Sawyer 2, G. M. Vigal sur, 819 ft from e and 450 ft from s line. C. O. Moore Oil Corp., St. Louis, Rudloff 11, B 53, C.C.S.L. sur, 450 ft from n and 650 ft from w line. F. A. Huber, Cisco, Cathey 1C, S 9, Bayland Asy. sur, 450 ft from e and 150 ft from s line; Carter 2A, S 9, Bayland Asy. sur, 400 ft from n and 150 ft from sw line; Carter 2, 300 ft w of No. 1. Welch & Bedingfield, Cross Plains, Cavanaugh 5, B 47, C.C.S.L. sur, 150 ft from n and 1375 ft from e line. Moutray Oil Co., Abilene, Hickman 29, S 149, B.B.B.&C. sur, 300 ft e of No. 27; Hickman 30, 300 ft n of No. 28.

CALDWELL COUNTY—Humble Oil & Ref. Co., Houston, Smith 1, A. Floyd sur, 150 ft from s and w lines; Johnson 1, Hinds sur, 1050 ft e of center of w line. Gulf Prod. Co., Houston, Reed 1, S. Seale sur, west central; Smith 1, A. Floyd sur, 150 ft from s and e lines; Conley 5, A. Floyd sur, 150 ft n of center of s line; Davis 1, G. Hinds sur, sw corner. Lu-Tex Oil Co., Luling, Wilson 3, A. Floyd sur, se of No. 2; Davis 5, A. Floyd sur, se central part of lease. D. F. Bryan, Houston, Davis 1, G. Hinds sur; Davis 2. J. B. Jarmon, San Antonio, Carter 1, G. Hinds sur, center.

COLEMAN COUNTY — Byrd & Golston, Brownwood, Moody 4, S 665, J. Scott sur, 300 ft s of No. 2. Roth & Faurot, Valera, Glover 1, S 201, F. Usner sur, 265 ft from s and w lines. Gwinnup and L. G. Bradstreet Co., Fort Worth, Morris 2, No. 269, R. Cochran sur, 300 ft n of No. 1. J. B. Dunnigan, Breckenridge, Rice 4, No. 91, D.&S. sur, 300 ft sw of No. 1. Texas American Synd., Dallas, Newton 2, No. 519, San Augustine sur, 150 ft from s and 1950



ON GUARD AGAINST EVAPORATION

In oil countries throughout the world MALONEY Bolted Steel Tanks are on guard against evaporation—their unusual *tightness* protecting petroleum products from loss of gravity and consequent decrease in selling value.

MALONEY tightness is insured by features exclusive to these tanks. Our patented "crimp" at seams and joints causes parts to fit with greater accuracy, our special rubber gasketing packs seams and bolt holes more tightly and, finally, our Gaso cement renders seams oil, water and gas tight.

MALONEYS are made of remarkably durable material—rust-resisting Keystone Copper Steel. We use bolts of 90,000 lbs. tensile strength. Large cleaning out plates are set flush with bottoms. Painting is with Maloney special pearl gray paint. Valves and thief hatches are the best on the market.

The MALONEYS shown above are four of the 3,000 barrel tanks used by the MacMillan Refining Company at Borger, Texas, erected, December, 1926.

"Alone in Quality"

MALONEY TANK MFG. CO.

TULSA, OKLA., U. S. A.

Distributors at All Principal Petroleum Points

Sizes: 12 to 10,000 Barrels

Packed in Steel-Bound Crates for Export

Howell Aluminum "4-in-1" Vacuum Pressure Valve and Thief-Hatch —The BEST and LATEST Deck Equipment—POSITIVE Safety

MADE OF KEYSTONE COPPER STEEL — MALONEY PATENTED BOLTED COPPER-STEEL TANKS — MADE OF KEYSTONE COPPER STEEL

MALONEY

MALONEY

ft from e line. Independent O. & G. Co., Midland, McCord 4, No. 700, J. H. Barkley sur, 1170 ft from e and 200 ft from s line. E. J. Cunningham et al, Coleman, Jennings C 5, No. 49, A. S. Lipscomb sur.

CHAMBERS COUNTY — Gulf Prod. Co., Houston, Willborn 1, A. Weaver sur, ne corner.

COOKE COUNTY—Kewanee Oil & Gas Co., Tulsa, Okla., Lanier A 4, E. T. Ry. sur, 50 ft we of No. 3.

CRANE COUNTY—Gulf Prod. Co., Fort Worth, McElroy 58, S 20, B F, C.C.S.D.& R.G.N.G. sur, 660 ft e of No. 52.

CHEROKEE COUNTY—Humble O. & R. Co., Houston, Weinberg 4, T. L. Trimble sur, 400 ft e of No. 3.

EASTLAND COUNTY—J. L. Hammon Jr., Ardmore, Okla., Potete B1, S 4, B 4, H.&T.C. sur, nw corner; Hartwick 1, S 41, B 2, H.&T.C. sur, 150 ft from n and e lines. Nick Nicklas, Clyde, Moore 1, 3186, T.E.&L. sur, 1320 ft from n and w lines. Texas Pacific Coal & Oil Co., Ranger, Fee 3, R.C.S.L. sur, 4350 ft from e and 4250 ft from s line. Moody Corp., Cisco, McClelland 2, S 466, S. P. Ry. sur, 1000 ft s of No. 1.

FORT BEND COUNTY—Gulf Prod. Co., Houston, Moore 18, M. Smith sur, 400 ft e of No. 17.

GRAY COUNTY — Prairie O. & G. Co., Ranger, Reynolds 2, S 61, B 3, I.&G.N. sur, 330 ft from n and w lines. Eslick Oil Co. Inc. & McKinley, Pampa, Hopkins 1, S 84, B B2, H.&G.N. sur, 330 ft from n and e lines. McLean Oil Co., Amarillo, Back 1, S 24, B 25, H.&G.N. sur, 330 ft from n and 990 ft from w line. Inspiration Oil Co., Amarillo, Morse 1, S 3, B 26, H.&G.N. sur, 330 ft from s and 990 ft from e line. Gardner Bros. & Collins, Wichita Falls, Saunders 1, S 1, J. G. Eustis sur, 398 ft from w and 300 ft from s line.

GLASSCOCK COUNTY—Magnolia Pet. Co., Dallas, Roberts 5, S 136, B 29, W.&N.W. sur, 330 ft from s and w lines.

GUADALUPE COUNTY—Miles Bros., Seguin, Springs 98, 1, E. Gotare sur, 450 ft from w and 775 ft from s line.

HOWARD COUNTY—Owen-Sloan Oil Co., Big Springs, Roberts 8, S 136, B 29, W.&N.W. sur, 330 ft from n and e lines. Magnolia Pet. Co., Dallas, Roberts 5, S 136, B 29, W.&N.W. sur. Witherspoon Oil Co., San Antonio, Kloh 1, S 3, B 32, Twp. 3s, 330 ft from w and 150 ft from s line.

HASKELL COUNTY—Moody Corp., Cisco, Raynolds 2, B 10, A. Rodriguez sur, 150 ft from e and 185 ft from s line.

HARRIS COUNTY—Gulf Prod. Co., Houston, Stateland 35, F. J. Demeritt sur, 85 ft e of No. 28; Fitzsimmons 2, No. 51, J. Hamilton sur, 1250 ft from s and 50 ft from e line; Smith 13, Wm. Scott sur, 434 ft from e and 259 ft from s line. T. G. Shaw, Fort Worth, Fitzsimmons 2, S 51, J. Hamilton sur, 1164 ft from e and 225 ft from w line.

HUTCHINSON COUNTY — Phillips Pet. Corp., Bartlesville. Okla Whittenburg 3, M Whitley sur, 364 ft from e and 330 ft from s line; J. Florence 4, M. Whitley sur, 330 ft from s and w lines.

JONES COUNTY—Robert Oil Corp. & Cosden & Co., Breckenridge, Grayson 7, S 13, B 18, T.&P. sur, 660 ft s of No. 6. Roeser & Pendleton, Inc., Fort Worth, Cassel 1, S 360, B 4, G.C.S.L. sur, center. Marland Prod. Co., Ponca City, Okla., Mason 5, S 18, B 19, T.&P. sur, sw corner; Mason 6, 330 ft from n and e lines. Robert Oil Corp. & Henderson, Breckenridge, Smith 2, S 51, B 18, T.&P. sur, 330 ft from s and 320 ft from w line; Smith 3, 320 ft from e and 330 ft from s line. Robert Oil Corp. & Cosden & Co., inc., Breckenridge, Grayson 6, S 13, B 18 T.&P. sur, 330 ft from n and 288 ft from e line.

JACK COUNTY — R. L. Hayes, Wichita Falls, Worthington 1, J. W. Buckner sur, 250 ft from s and w lines. E. W. Walton, Graham, Hoelfe 1, O. H. P. Davis sur, 150 ft from n and w lines.

JEFFERSON COUNTY—M. E. Pivito, Sour Lake, Gladys 3, B 20, J. A. Veatch sur, sw corner. Yount-Lee Oil Co., Beaumont, McFaddin, P. Humphreys sur, 332 ft from e and 978 ft from n line.

JASPER COUNTY — Mark Kleedon, Beaumont, Boykin 3, B.B.B.&C. sur, 300 ft se of No. 1.

KNOX COUNTY — Dixie Oil Co., Inc., Wichita Falls, Smith 1, S 46, B 2, D.&W. sur, 660 ft from n and e lines.

LIBERTY COUNTY—Texas Co., Houston, Staiti 17, M. G. White sur, 170 ft w of No. 15; Staiti 16, 100 ft e of No. 14. Gulf Prod. Co., Houston, Chambers 6, M. G. White sur, 50 ft from n and e lines; Chambers 7, 175 ft sw of No. 3. Deering & Kayser, Esperson Bldg., Houston, Pruitt 2, S 135, H.&T.C. sur, 150 ft e of No. 2.

LOVING COUNTY—Lockhart & Co., Pecow, Lloyd 1, S 3, B 2, W.&N.W. sur, sc corner.

LYNN COUNTY—Dr. H. F. Miller, Slaton, May 1, S 10, B 7, E.L.&R. sur, 500 ft n of center of s line.

MILAM COUNTY—Minerva Pet. Co., Minerva, Watson 20, T. J. Chambers sur, 380 ft nw of No. 19.

MONTAGUE COUNTY—Pure Oil Co., Fort Worth, Keck A 10, Wm. Donoho sur, 450 ft s of No. 9. Continental Oil Co., Wichita Falls, Jones A 5, Wm. Donoho sur, 450 ft w of No. 4.

MOORE COUNTY — Fritch O. & G. Co., Amarillo, Bivins 1, No. 4, W. T. Palmer sur, center of ne ¼.

McLENNAN COUNTY—L. H. Smith, Hillsboro, Smith 1, R. D. Price sur, 175 ft from n and w lines.

NOLAN COUNTY—Root Drilling Co., Eastland, Simpson 1, S 33, B 19, T.&P. sur, 300 ft from n and e lines.

PALO PINTO COUNTY—Morgan, Reeves & Atlantic Oil Prod. Co., Dallas, Stuart 1, S 50, B 4, T.&P. sur, south central. Texas Pacific Coal & Oil Co., Ranger, Stuart 151, S 71, B 4, T.&P. sur, 2425 ft from s and 2300 ft from e line.

PANOLA COUNTY — Eureka Nat. Gas Corp., Shreveport, La., Gulley 1, J. Matthews sur, 275 ft from n and 325 ft from e line; Beekell 1, E. Williams sur, 325 ft from s and w lines.

PECOS COUNTY—Talbott & Dittman, Fort Stockton, Unsicker 1 S 25, B 10, H.&G.H. sur, 2640 ft from nw and 1320 ft from sw line. California Co., Iraan, Smith 1, S 15, B 194, G.C.&S.F. sur, 1010 ft from n and e lines.

REFUGIO COUNTY — Magnolia Pet. Co., Dallas, Glenwinkle 1, J. Scott sur, 330 ft from s and e lines. Union Exploration Co. of Texas, Houston, Heard 1, B 8, Refugio sur, 150 ft from s and e lines.

SHACKLEFORD COUNTY—Marland Prod. Co., Ponca City, Okla., Flippen 4, S 30, B 11, T.&P. sur, 330 ft from s and w lines. Midwest Exploration Co., Amarillo, Dyer 3, S 85, B 12, T.&P. sur, 633 ft from n and 657 ft from e line. Texas Co., Wichita Falls, Sedwick 8, S 1, B 1, E. T. Ry. sur, 315 ft w of No. 4. Less Combest et al, Mineral Wells, Broyles 16, S 7, L.A.L. sur, 600 ft grom n and 150 ft from w line; Alexander 60, 5, SC7, L.A.L. sur, 750 ft from w and 150 ft from s line. Amerada Pet. Corp., Cisco, McCauley 1, B. B. Stansell sur, nw corner. T. G. Shaw, Fort Worth, Rice 21, S 20. Bayland Asy. sur, 300 ft n of No. 15. Craig Norton & Co., Inc., Albany, Ezell 1, S 3, L.A.L. sur, 150 ft from n and w lines. Cranfill & Reynolds, Cisco, Flippen 2A, S 34, B 11, T.&P. sur, 150 ft from n and e lines; Flippen 3A, S 35, 450 ft from n and 150 ft from w line.

STEPHENS COUNTY — Bateman & Scott, Breckenridge, Allen 1, S 14, B 2, S. P. Ry. sur, 400 ft from n and w lines. Cranfill & Reynolds, Cisco, Morris 1, S 64, B 6, T.&P. sur, 750 ft from n and 450 ft from e line.

SUTTON COUNTY — Phillips Pet. Corp., Bartlesville, Okla., Cauthorn 1, S 17, C.C.S.D.& R.G.N.G. sur, 330 ft from n and w lines.

THROCKMORTON COUNTY — R. B. Fields, McLemore Hotel, Albany, T. C. S. L. 1, S 11, J. C. McNeill sur, 500 ft from n and 630 ft from w line.

WICHITA COUNTY—Staley-Wynne & Co., Wichita Falls, Kemp & Kempner 6, B 82, W.V.F.L. sur, 75 ft w of No. 1. W. J. Moran, Wichita Falls, Warren 1B, L. B. Taliaferro sur, 150 ft from n and 1395 ft from w line. Holbrook & Woods, Wichita Falls, Kemp & Pemp-ner, B 82, W.V.F.L. sur, 50 ft s of No. 23. Mrs. Lanning et al, Wichita Falls, McCarty 8, S. O. Fowler sur, 300 ft w of No. 17. Panhandle Ref. Co. & Hines, Wichita Falls, J. & J. Waggoner 14, S 2, G.C.&S.F. sur, 300 ft s of No. 3.

WILBARGER COUNTY — Waggoner Ref. Co., Wichita Falls, Waggoner G 3, S 24, B 4, H.&T.C. sur, 205 ft from s and w lines; 4, 455 ft na of No. 3; 5, 205 ft from n and w lines; 6, 455 ft e of No. 3; 7, 205 ft from n and e lines; 8, 455 ft s of No. 7; Waggoner K 1, S 31, B 4, H.&T.C. sur, 1213 ft from e and 205 ft from s line; 2, 709 ft from e and 205 ft from s line. C. U. Beasley, Electra, Waggoner 1, S 18, B 5, H.&T.C. sur, 2490 ft from w and 1470 ft from s line. Texas Co., Wichita Falls, Waggoner C7, S 24, B 4, H.&T.C. sur, 663 ft from n and 205 ft from e line; C8, 150 ft from n and 205 ft from e line. Waggoner Ref. Co., Wichita Falls, Waggoner 50, S 33, B 4, H.&T.C. sur, 455 ft nw of No. 4; 6, 455 ft nw of No. 2; 7, 455 ft nw of No. 3; Waggoner E 7, S 30, B 4, H.&T.C. sur, 300 ft se of No. 6; 8, 300 ft nw of No. 6; 9, 300 ft nw of No. 8; 10, 300 ft nw of No. 9; 11, 300 ft se of No. 7.

WINKLER COUNTY—Empire G. & F. Co., Wichita Falls, Daugherty B 1, S 3, B 74, 300 ft from s and w lines; Daugherty A 2, S 3, B 74, 330 ft from s and e lines; 3, 330 ft n of center of s line. Humble O. & R. Co., Wichita Falls, Hendrick C2, S 10, B B12, 440 ft from n and 330 ft from w line. Warner-Quinlan Co., Dallas, Leck 1, S 3, B 74, 330 ft from s and e lines.

WEBB COUNTY—O. W. Killam, Laredo, A. M. Bruni 28, B 64, Albercas sur, 874 ft from w and 1873 ft from s line; 29, 894 ft from w and 1745 ft from s line. O'Hern & Seacord, Laredo, Benavides 7, S 174, B 11, 535 ft from ne and 540 ft from se line. Jno. J. O'Hern, Laredo, Benavides 1, S 697, B 6, 150 ft from s and e lines. Sun Oil Co., Dallas, Yeager-Stroman 9A, No. 5, Las Animas sur, 300 ft s of No. 8A.

WHARTON COUNTY—South Texas Pet. Co., Houston, Hyde 1, S. F. Austin sur, ne corner. Ferdinand, Heine, Jacksonville, Woytek 9, S. F. Austin sur, 40 ft from e and 500 ft from s line.

WHEELER COUNTY — Johnston & Co., Shamrock, Purcell 1, S 50, B 17, H.&G.N. usr, 430 ft n and 565 ft from w line. Hartell & Anderson et al, Shamrock, Bircham 1, S 91, B 17, H.&G.N. sur, 660 ft from n and w lines.

YOUNG COUNTY—Cal T. Scott, Wichita Falls, Broyles 1, B.S.&F. sur, 150 ft from n and e lines. Pitzer & West, Breckenridge, Bryan 1, N. Lynch sur, 200 ft from e and w lines. R. P. Dorian et al, Wichita Falls, Johnson 2, B 12, E. W. Sergeant sur, 150 ft from s and e lines. Continental Oil Co. & Underwood Drilling Co., Wichita Falls, Campbell B, B3, 1390, T.E.&L. sur, 1000 ft from n and 600 ft from w line. Riggs & Oliphant, Graham, McKinley 22, 1489, T.E.&L. sur, 750 ft from s and 1136 ft from e line. Creath & Knell, Wichita Falls, Eichelberger 1, 1472, T.E.&L. sur, 150 ft from n and e lines. Holbrook & Woods, Wichita Fals, Watson 5B, Y.C.S.L. sur, 360 ft w of No. 3. Panhandle Ref. Co., Wichita Falls, Prideaux 10C, A. Rohus sur, 300 ft w of No. 3. Magnolia Pet. Co., Dallas, Johnson 6, E. W. Sergeant sur, 300 ft nw of No. 2. Senior Oil Co. & Riggs & Oliphant, Graham, Sweet 7, 1488, T.E.&L. sur, 150 ft from n and 2100 ft from e line. R. P. Dorian et al, Wichita Falls, Boone 12, B.B.B.&C. sur, 300 ft s of No. 3. L. T. Burns, Wichita Falls, Stewart 1, No. 76, D. Dawson sur, 150 ft from s and w lines. Moran Drilling Co., Wichita Falls, Graham 3, 193, T.E.&L. sur, 150 ft from s and 750 ft from w line.

ZAPATA COUNTY—South Texas Prod. Co., Laredo, Jennings 2, C. Blanco sur, 300 ft e of No. 1. R. V. Hill, San Antonio, Ramirez 3, No. 627, T. Bertrang sur, 50 ft w of No. 2.

ABREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

WILDCATS FROM ALL SECTIONS

SOUTHWEST TEXAS

Completions

Company, Well and Location	Initial Production Bbls.	Depth
WEBB COUNTY—		
Wm. R. Jewell, Bruni 1, blk 8, sur 857	*	80
Louis Hausman, Callaghan 2, sur 440	*	665
BASTROP COUNTY—		
Cranfill & Reynolds, and A. M. Loomis, Andy Yost 2, Cedar Creek	250	1537

BASTROP COUNTY—Cranfill & Reynolds' Yost 1, Cedar Creek, flowing 250 bbls daily from Serpentine at 1529-37 ft; Yost 3, ru. Amerada Pet. Corp.'s Yost 1, Cedar Creek, tested salt water at 1767, plugged back to 1700, top Serpentine at 1548 ft. Atlantic Oil Producing Co.'s Yost 1, Cedar Creek, dr 848 ft shale. The Texas Co.'s Yost 1, Cedar Creek, dk. Gypsy Prod. Co.'s Lottmann 1, e Bastrop, sd 2145 ft.

DUVAL COUNTY—Sun Oil Co.'s Norton 1, dr 2345 ft; Norton 2, ru. R. Driscoll, Fee 13, dr 1250 ft shale. O. Henry Oil Co.'s Henry 1, ru.

EDWARDS COUNTY — McMan Oil Co.'s Schreiner 1, ne part of county, dr 3880 ft.

HIDALGO COUNTY—Queen City O. & G. Co.'s American Land & Irrigation Co. 2, 3 mi n Mercedes, sd 700 ft.

JIM HOGG COUNTY—T. J. Conway's Ualacios 1, r 2010 ft.

JIM WELLS COUNTY—Cushing Oil Co.'s Perez 2, 3 mi n Alice, sd 2700 ft.

KINNEY COUNTY—Stephens et al's Clamp 1, sd 1800 ft.

MAVERICK COUNTY—Rycade's Sullivan 3, sd 4500 ft; Chittem 2, fsh 7635 ft; Chittam 3, ru. Ryan Consolidated Pet. Co.'s Indio Co. 2, td 1175 ft.

NUECES COUNTY — Maddox-Horn-Davis' Ragland 1, Aqua Dulce, sd 400 ft. Sigmond et al's Allan 1, dr 2850 ft shale. Rosenblum & Grimm's Alban 1, aqua Dulce, sd 2830 ft.

SAN PATRICIO COUNTY — LaPrelle et al's White Point 1, td 3130 ft. Pickett et al's Whitworth 1, White Point, sd 3250 ft. Leach et al's Collins 1, Mathis, dr 2422 ft shale.

STARR COUNTY—The Texas Co.'s Resendez 1, dr 2774 ft, sandy shale.

WEBB COUNTY—Baker Oil Co.'s Bruni 1, blk 7, sur 735, sd 2510 ft. G. S. Lumpkin's Yeager 1, lcn.

WEST TEXAS

Completions

Company, Well and Location	Initial Production Bbls	Depth
CROCKETT COUNTY—		
T. W. Callahan et al, Todd 1	*	2208
Texas-Canadian Oil Co., University 1	*	1561
FISHER COUNTY—		
Roeser-Pendleton-Landreth, Decker 1-B	*	3314
HOWARD COUNTY—		
Louisiana Oil Ref. Corp., Kloh 1	*	3217
IRION COUNTY—		
Sun Oil Co., Williams 1	*	3675
KENT COUNTY—		
Cosden & Co., Inc., Bilby 1	*	3555
KING COUNTY—		
The Texas Co., Johnson 1	*	4298
MENARD COUNTY—		
Panhandle Ref. Co. et al, Eckhardt 1	*	3225
J. C. Barnett & Drake, Callan-Rasmussen 1	*	2150
PECOS COUNTY—		
Pecos Valley Oil Co., Fee 1	115	1628
REAGAN COUNTY—		
Empire Gas & Fuel Co., Sawyer 1-A	*	3030
SUTTON COUNTY—		
Phillips Pet. Co., Cusenbary 1-A	*	1010

ANDREWS COUNTY—Deep Rock Oil Co.'s Hostetter 1, dr 1200 ft. Mid-Continent Pet. Corp.'s M. M. Fisher 1, lcn.

BORDEN COUNTY—Condor Pet. Co.'s Hall 1, elev 2601 ft, top salt 1235 ft, top lime 2962 ft, sd 3235 ft. E. L. Doheny et al's Koonsman 1, elev top salt 900 ft, top lime 2430 ft, dr 3795 ft.

BREWSTER COUNTY—Ed. W. Bateman & Co.'s Nevill 1, elev 3950 ft, dr 835 ft. Brewster Oil Co.'s Fee 1, machine. Cowden-Cole et al's Jackson 1-A, sd 2000 ft. Forest Oil Corp.'s Skinner 1, sd 1150 ft. Van McPhail et al's McIntyre 1, sd 1765 ft. Clayton Williams et al's Poncey 1, sd 500 ft.

COKE COUNTY — Cates & Dennis' J. R. Mims 1, sd 1465 ft. Lipan Oil Co.'s Rawlings 1, sd 2840 ft. Louisiana Oil Ref. Corp.'s Powers 1, elev 2040 ft, cem cas 3065 ft. Mid-Kansas O. & G. Co.'s Lackey 1, dr 2330 ft.

CONCHO COUNTY—K. Kimberlin et al's Maloy 1, sd 1460 ft. Lloyd Jones et al's Jones 1, dr 155 ft.

CRANE COUNTY—Gulf Prod. Co.'s Waddell 5, fsh tools after shot, td 3483 ft; Waddell 6, rig.

CROCKETT COUNTY—Barbara Oil Co.'s Cox 1, elev 2051 ft, top lime 1082 ft, sd hfw 1270-72 ft. V. T. Bolin & Co.'s Coates 1, sd 2110 ft. W. W. Donnelly et al's Shannon 1, (Sec. 9) elev 2486 ft, sd showing oil and gas, td 1719 ft. Donnelly-W. A. Moncrief et al's Todd 1, (Sec. 35), spudded and sd. J. D. Wheeler et al's State eFe1, sd 285 ft. F. P. Zoch-W. A. Moncrief et al's Tippett 1, cavey hole 140 ft.

CULBERSON COUNTY — Deep Rock Oil Co. et al's Seay 2, dr 815 ft. J. M. Hickey et al's Finley 1, sd 1660 ft. Scott & Dittman's Miller 1, sd 1765 ft. West Texas Oil & Explo. Co.'s McGregor 1, sd 385 ft.

JEFF DAVIS COUNTY—Sam F. Means et al's J. Z. Means 1, sd 3271 ft.

DAWSON COUNTY — Magnolia Pet. Co.'s W. R. Jeter 1, elev 2889 ft, top salt 1640 ft, dr 3115 ft.

EDWARDS COUNTY—Gale Oil Co.'s Jernigan 1, sd 2700 ft. McMan O. & G. Co.'s Schreiner 1, dr 3885 ft.

EL PASO COUNTY—C. E. Sillix et al's Malone 1, sd 1010 ft.

FISHER COUNTY—Bickerstaff-Simmons & Cochran's McWhirter 1, set cas 1875 ft. Cranfill-Reynolds et al's Sharp 1, dr 2645 ft; M. M. Brown 1, lcn. J. B. Dunnigan et al's Henry 1, dr 1130 ft. Hucony Gas Co.'s Marberry 1, elev 1876 ft, sd 2840 ft. R. W. Rainey et al's Marberry 1, elev 1929 ft, top lime 2995 ft, sd hfw 3507 ft. Thompson et al's Newman 1, spudding.

GAINES COUNTY—Pure Oil Co.'s Williamson 1, dr 835 ft.

GARZA COUNTY—Emerald Oil Co.'s Boren 3, pb for second shot, td 4801 ft.

GLASSCOCK COUNTY—Gibson-Johnson et al's B. C. Mann 1, rig. Meriwether Oil Co.'s McDowell 2, ur cas 690 ft. White Eagle O. & R. Co.'s R. S. Dunbar 1, lcn. World Oil Co.'s L. S. McDowell 1-C, rig.

HOWARD COUNTY—Worth B. Andrews et al's Neal 1, elev 2731 ft, top salt 2015 ft, top lime 3150 ft, sd 3278 ft. Greene O. & R. Co.'s Furrh 1, elev 2277 ft, top salt 1255 ft, top lime 2097 ft, dr 2630 ft; Slaughter 1, dk. Group One Oil (Texon) Corp.'s Quinn 1, elev 2499 ft, top salt 1070 ft, top lime 3103 ft, show oil 3185-90 ft, dr 3205 ft. Group One & Marland Prod. Co.'s Eason 1, dr 1675 ft; Settles 4, dr 1860 ft; Settles 6-A, r 2080 ft. L. C. Harrison et al's Dodge 1, elev 2321 ft, top lime 1830 ft, sd 3257 ft. Henshaw (now American-Maracaibo Co.'s) Settles 2-A, dr 1980 ft; Settles 1-B, elev 2680 ft, top lime 2085 ft, swab 368 bbls oil 2933-38 ft; Settles 1-C, dr hfo at 2208-34 ft; Settles 2-C, dr 2050 ft; Settles 3-C, rig. Howard County Oil Corp.'s Kloh 1, spudded and sd. Louisiana O. R. Corp.'s Settles 2, dr 1740 ft. Phillips Pet. Co.'s Thomas 1, elev 2591 ft, top salt 1170 ft, sd 2435 ft. Plymouth Oil Co.'s Kloh 1, spudded and sd. Taylor-Link Oil Co.'s Kloh 2, spudding. Witherspoon et al's Kloh 1, spudded and sd.

HUDSPETH COUNTY — The California Co.'s University 1, dr 231 ft. Western States Oil Co.'s Gardner-Mosely 1, sd 3125 ft; S. W. Moore 1, fsh 2750 ft.

IRION COUNTY—Fuhrman Pet. Corp.'s J. D. Suggs 1, 2 and 3, lcns. Kimbrough et al's Nutt 1, sd 1400 ft. Kimbrough & Finchbaugh's Tankersley 1, lcn. Kingwood Oil Co.'s J. D. Sugg 1, elev 2334 ft, swab 25 bbls daily, td 3435 ft. Mertzon Oil Co.'s Rach 1, sd 2202 ft. Signal Oil Co.'s Sugg 1, elev 2415 ft, top salt 705 ft, sd hfw 2585 ft. Webb et al's Nutt 1, dr 2230 ft.

JONES COUNTY—Annabelle Oil Co.'s Bickley 1, rig. Atkinson & Sandefer's Hudspeth 1, sd 2390 ft. E. P. Campbell et al's C. Herndon 2, lcn. W. G. Clark et al's Thomas 1, ur 2220 ft. Cosden & Herbert Oil Co.'s Bickley 6, dr 935 ft; Bickley 7, lcn. Cranfill-Reynolds & Dilworth's Bickley 1, top lime 2444 ft, testing 1500 ft, oih 2466-77 ft. Hucony Gas Co.'s Thomas 1. lcn. Independent O. & G. Co.'s Smith 2, spudding; Smith 3, rig. Marland Prod. Co.'s Mason 5 and 6, rigs. McNeeley et al's Bland 1, spudded and sd. Mid-Sun Oil Corp.'s Hoelm 1, dr 880 ft. Phillips Pet. Co.'s Campbell 1, lcn; Mason 5, rig; Pomroy 2, rig; Joe Winters 1-W, rig. Milt Richardson et al's Martin 1, sd 900 ft. Robert Oil Corp. et al's Grayson 6, dr 1660 ft; Grayson 7, dk. Roeser-Pendleton-Landreth's Castle 1, dk; Grayson 3, dr 2103 ft. Sedwick O. & G. Co.'s Routh 1, dk. Sinclair O. & G. Co.'s Smith 2, dr 2525 ft. Snowden & McSweeney's Bickley 4, dr 1015 ft; Bickley 5, rig. Texas Co. & Cosden & Co.'s Carter 3, dr 1425 ft; Carter 4, dr 735 ft; Carter 5, rig. Tomberlin et al's Horn 1, lcn. Woods & Williams' Parr 1, set cas 2100 ft.

LOVING COUNTY—Lockhart & Co.'s R. L. Allison 2, top salt 722 ft, dr 3940 ft.

LYNN COUNTY—Geo. B. McCamey et al's C. O. Edwards 1, rig.

MIDLAND COUNTY—O. H. Shoup et al's Parks 1, elev 2871 ft, top salt 1740 ft, dr 4455 ft.

MIDLAND COUNTY—O. H. Shoup et al's Parks 1, elev 2871 ft, top salt 1740 ft, dr 4455 ft.

MITCHELL COUNTY—E. P. Campbell et al's Pond 1, dr 835 ft. Hucony Gas Co.'s Weichsel 1, elev 2139 ft, top salt 550 ft, top lime 1342 ft, sd 2855 ft. Teas & Wheeler's Radford 1, elev 2223 ft, top lime 1365 ft, dr 2515 ft.

NOLAN COUNTY—T. G. Bradstreet et al's H. Kuteman 1, rig. Herbert Oil Co.'s Pepper 1, elev 2242 ft, dr 3435 ft. C. M. Root et al's H. D. Simpson 1, dr 135 ft. White Eagle O. & R. Co.'s Allyn 1, dr 960 ft.

PECOS COUNTY—Alexander-Lyles et al's Sellman 1, elev 2672 ft, top salt 814 ft, top lime 1602 ft, sd hfw 1655 ft. Anderson et al's University 1, elev 2801 ft, top salt 1030 ft, top lime 1715 or 1760 ft, set cas to test show oil with water 1879-90 ft. Atlantic Oil Prod. Co.'s Sellman 1, sr 800 ft. Benedum-Trees et al's Corder 1-A, top lime 1840 ft, dr 2445 ft. M. Z. Dibble et al's Bonebrake 1, elev 2555 ft, top salt 1874 ft, sd 204 ft. Ditto Oil Interests' Montgomery 1, sd 660 ft. J. W. Grant et al's Turney 1, elev 2592 ft, sd 3850 ft. McCarty Oil Co.'s Bennett 1, dr 1115 ft. Mauch & Krogen's Holmes 1, elev 2352 ft, top salt 535 ft, sd 1138 ft. Phillips Pet. Co.'s J. L. Nutt 1, rig. Rio Pecos Oil Co.'s Yates 1, top lime 1099 ft, dr anhydrite and shale 1415 ft. Southern Crude Oil Pur. Co.'s Scarbauer 1, elev 2680 ft, dr 3340 ft. Talbot & Dittman's Unsicker 1, spudded and sd. Transcontinental's University 1, elev 2552 ft, top lime 1035 ft, pull casing 4128 ft. World Oil Co.'s Kloh 1, elev 2810 ft, sd 3105 ft. Yates Ranch Oil Co.'s Yates 1, fsh 117 ft.

PRESIDIO COUNTY—Eastland Oil Co. et

Los Angeles.—The Smith Petroleum Company has secured a water shutoff in Berry 1, in the Hawthorne field, and will make a production test after making additional hole. The well was drilled to 5700 feet and a string of 6¼-inch casing cemented through perforations at 5325 feet. The test is being made at about the same level from which the discovery well was completed and is still producing.

al's Tootle 1, spudded and sd. L. C. Brite Production Co.'s Brite 1, set cas to test show oil 4113 ft, td 4152 ft. Empire-Delmad & Phillips Pet. Co.'s Tootle 1, dr 1050 ft.

REAGAN COUNTY—Skelly Oil Co.'s University 3, elev 2895 ft, top salt 1320 ft, top lime 3010 ft, swab 45 bbls oil 3085-95 ft. Big Lake Oil Co.'s University 151 (deep test) fsh 2065 ft. Texon Oil & Land Co.'s University 1-B, (world's deepest well), flow 675 bbls 53. deg oil and ten million ft gas 8500-8523 ft; University 61, sd 3900 ft.

REEVES COUNTY—E. W. Brooks-Thompson et al's Eddins 1, elev 2719 ft, top salt 1622 ft, top gray lime 3216 ft, sd 5658 ft. D. P. Davis et al's Kinney 1, spudded and sd. Exploration Co.'s Kinney 1, elev 2847 ft, sd 2900 ft. Dr. Kitsos et al's Kloh 1, set cas 840 ft. R. R. Penn et al's E. G. Bowles 1, rig.

RUNNELS COUNTY—G. W. Boyce et al's Lange 1, rig. Foster et al's Currie 1, lcn. Ira Nourse & Tilton's Cramer 1, dr 905 ft. Union Oil Co.'s Allen 1, dr 1385 ft. Vacuum Oil Co. et al's Brevard 1, dr 885 ft.

SCHLEICHER COUNTY — Ft. McKavitt Oil Co.'s Tisdale 1, sd 260 ft.

SCURRY COUNTY—Landreth Prod. Corp.'s Hillmer 1, elev 2314 ft, top salt 870 ft, dr 3965 ft. J. B. Mims et al's Koonsman 1, spudded and sd. R. B. Pender O. & G. Co.'s Davis 1, elev 2208 ft, top salt 445 ft, sd 910 ft.

STERLING COUNTY—Foster & Gracey Oil Co.s' Foster 1, elev 2260 ft, dr 1630 ft.

STONEWALL COUNTY—Sun Oil Co. et al's Rayner 1, elev 1818 ft, top lime 1500 ft, sd 3365 ft.

SUTTON COUNTY — Phillips Pet. Co.'s Holman 1, fsh 5775 ft. Southern Crude Oil Pur. Co.'s Allison 1, dk.

TAYLOR COUNTY—Burnham et al's Amyx 1, dr 1330 ft. Grisham-Hunter Corp.'s H. E. Campbell 1, lcn. Hurley Oil Co.'s Payne 1, top lime 2473 ft, co 2615 ft. Mid-Kansas O. & G. Co.'s Parramore 1, ur 1830 ft. Mid-Continent Pet. Corp.'s J. H. Taylor 1, spudded and sd.

TERRELL COUNTY—Big Bend Oil Corp.'s Bassett 1, spudded and sd. Mrs. J. B. McPhee et al's Sam Belt 1, spudded and sd. Milham Corp.'s Bassett 1, elev 2270 ft, sd 4385 ft. Keck-Pecos Oil Trust's Hamilton 1, sd 1749 ft.

TERRY COUNTY — Superior Oil & Gas Corp.'s Brownfield 1, elev 3205 ft, dr 4595 ft.

UPTON COUNTY—Keck Investment Co.'s McClintic 1, elev 2652 ft, top salt 1100 ft, top lime 2725 ft, pumped 107 bbls oil 12 hours, td 2944 ft.

VAL VERDE COUNTY—Dyer Bros. et al's W. E. Wilson 1, sd 1380 ft. Producers Oil Co. et al's Everett 1, dr 1105 ft. Val Vert Oil Corp.'s Bassett 1-A, sd 1250 ft.

WARD COUNTY—E. B. Lovelace et al's Redman 1, spudded and sd. Prairie O. & G. Co.'s Sealy 1, elev 2666 ft, top salt 1073 ft, top lime 3110 ft, ur 3265 ft. Rector Oil Co.'s Johnson 1, elev 2438 ft, top salt 745 ft, top lime 2010 ft, dr 2400 ft. J. F. Shipley et al's Hayzlett 1, elev 2503 ft, top salt 727 ft, flow 100 bbls 34 deg. oil daily 2480-81 ft. Talbot et al's C C. Dorr 1, fsh 735 ft.

WINKLER COUNTY—Amerada Pet. Corp.'s Daugherty 2, elev 2891 ft, top lime 2654 ft, dr 2660 ft; Daugherty 3, dr 910 ft. Atlantic-Kessler & Logan's Daugherty 2, elev 2894 ft, top lime 2622 ft, set cas to case off 60 million ft gas 3140 ft. Barnsdall Oil Co.'s Morton 1, elev 2730 ft, top lime 2870 ft, stdz 2884 ft; Morton 2, sd 1095 ft; Morton 3, dk. Empire G. & F. Co.'s Daugherty 2, top lime 2690 ft, dr 2695 ft; Daugherty 3, dr 2265 ft; Daugherty 1-B, dr 2275 ft. Gulf Prod. Co.'s O'Brien 2, top salt 2077 ft, stdz 2081 ft; O'Brien 3, stdz 2150 ft. Magnolia Pet. Co.'s Scarborough 1, elev 2953 ft, top salt 1122 ft; top lime 2700 ft, flowed 10 bbl head, co 2840 ft. Marland Prod. Co.'s Morton 1, dr 1700 ft; Morton 2, dk. Prairie O. & G. Co.'s Daugherty 1, dr 855 ft; Daugherty 2, dr 435 ft; Morton 1, dr 565 ft. Shell Pet. Corp. & Danciger O. & R. Co.'s Daugherty 1, dr 1100 ft; Daugherty 2, dr 1515 ft. Simms Oil Co. et al's Sealy 1, dr 610 ft. Warner-Quinlan Co.'s Daugherty 1, spudding. Wentz Oil Corp.'s Morton 1, top salt 1706 ft, dr 1935 ft.

SOUTH LOUISIANA

Completions

Company, Well and Location	Initial Production Bbls.	Depth
CAMERON PARISH—		
Cameron Oil Co.-Rycade Oil Corp., Duhon 2, Hackberry Dome	240	3151
IBERVILLE PARISH—		
Standard of La., Wilbert 1, Bayou Blue dome	*	4481

ACADIA PARISH—E. F. Somms' Clement 1, Jennings, sd for orders, td 3872 ft; Clement 2, Jennings, sd 3840 ft; Grace von Schueler 1, Jennings, testing at 3880 ft; Jennings Oil Co. 1, Jennings, sd 3545 ft; Cockrell 1, Jennings, sd 4330 ft.

ASCENSION PARISH—Gulf's United Lands Co. 11, Sorrento, ru. Triumph Oil Corp.'s Lacey et al 2, 1½ mi se Sorrento, set 10-inch at 1100 ft. Burnside Oil Co.'s Roberts 1, td 785 ft. Baton Rouge Pet. Co.'s Liotta 1, sd 1000 ft.

CALCASIEU PARISH—Union Sulphur Co.'s Fee 729, Sulphur dome, dk; Fee 731, Sulphur, td 4796 ft; Fee 733, Sulphur, td 3845 ft; Fee 735, Sulphur, sn at 4240 ft; Fee 736, Sulphur, dk; Fee 737, Sulphur, td 2175 ft; Fee 738, ru; Fee 740, lcn. Lahay et al's Jones 2, sd 2500 ft. J. W. Watson et al's La. Land Co. 1, Sulphur, sd 4397 ft.

CAMERON PARISH—Pure Oil Co.'s Yount-Lee 7, Sweet Lake, dr 70 ft; Yount-Lee 8, Sweet Lake, lcn. Calcasieu Oil Co.'s Breaux 1, Kelso Bayou, dr 3624 ft gbo; Valery 5, Kelso Bayou, dr 170 ft; Watkins 12, Kelso Bayou, will set cas at 3955 ft. Cameron Oil Co.'s Duhon 2, Hackberry, completed for 240 bbls oil at 3151 ft. Rycade Oil Corp.'s Yount-Lee Oil Co. 1, Hackberry, dr 3005 ft rock. Cameron Oil Co.'s Vincent 1, Hackberry, lcn. Yount-Lee Oil Co.'s School Land 8, Hackberry, td 3600 ft. Shell Pet. Corp.'s Watkins 5, Black Bayou dome, td 1235 ft; Watkins 6, Black Bayou dome, ru.

IBERIA PARISH—La. Land & Exploration Co.'s Avery Island 2, td 5835 ft; Vermilion Bay A-3, Cypremont Point, set 12½-inch at 960 ft; Bernard 1, New Iberia dome, td 2332 ft. Gulf's State Z-7, Loreauville, ru; State Z-8, Loreauville, ru; Kling 2, Loreauville, dk.

IBERVILLE PARISH—Shell Pet. Corp.'s Wilbert 3, White Castle, ru. Standard of La.'s Wilbert 1, Bayou Blue dome, abn in salt at 4481 ft; Wilbert 2, Bayou Blue dome, lcn; Schwing 1, Bayou Blue dome, ru. Union Sulphur Co.'s Schwing 3, Bayou des Glaise, testing at 2730 ft.

LA FOURCHE PARISH—Gulf's Stark et al 8, Thibodeaux, ru.

ST. MARTIN PARISH—Rycade Oil Corp.'s State 3, Bayou Bouillon, lcn. Bayou Bouillon 4, swabbing at rate of 100 bbls per hr. at 3345 ft; Bayou Bouillon 5, td 3633 ft; Bayou Bouillon 6, dk; Atchafalaya Fee 3, Bayou Bouillon, coring sand and shale at 4011 ft; Atchafalaya Fee 4, Bayou Bouillon, dr 3788 ft sandy lime; Atchafalaya Fee 5, Bayou Bouillon, lcn. Ohio Oil Co.'s Martin et al 3, Hager dome, dr 3925 ft hard sand. Yount-Lee Oil Co.'s La. Pet. Co. 3, Anse la Butte, sd 2755 ft.

ST. MARY PARISH—J. Dannenbaum's Le Blue 1. Charenton, shale 3015 ft.

ST. TAMMANY PARISH—Pearl Oil Corp.'s Fritsche 1, Slidell, td 1768 ft.

TANGIPAHOA PARISH — Kentwood Pet. Co.'s Kent Realty Co. 1, td 1572 ft. Tanli Oil Co.'s Weinberger 2, dr 3185 ft sandy shale.

TERREBONNE PARISH — Southern Gas Co.'s Peoples Sugar Co. 1, Houma, td 2287 ft.

WEST FELICIANA PARISH—Robinson & Long's Raccourci 1, td 300 ft.

TEXAS GULF COAST

Completions

Company, Well and Location	Initial Production Bbls.	Depth
BRAZORIA COUNTY—		
Empire O. & G. Co., Brock 1, Stratton Ridge	*	2245
COLORADO COUNTY—		
The Texas Co., Hoyo 1, Eagle Lake.	*	1520
FORT BEND COUNTY—		
Gulf, Moore 17, Moore's Field	*	4195

AUSTIN COUNTY — Humble's Hardy 1, Raccoon Bend, dr 1095 ft hard shale and lime; Hard 2, Raccoon Bend, drk; A. Grawunder C-1, Raccoon Bend, wtg on cement to set, 1336 ft; Beal 1, Raccoon Bend, dr 3100 ft shale; Bracey B-1, Raccoon Bend, dr 3273 ft sand shale; Walton 2, Raccoon Bend, waiting on cement to set at 1172 ft; Grawunder B-1, Raccoon Bend, td 3262 ft; Urban 2, Raccoon Bend, pumping mud in casing; Urban 3, Raccoon Bend, set cas at 198 ft.

BRAZORIA COUNTY — Shell Pet. Corp.'s Allen 5, Allen dome, coring sandy shale at 4037 ft, odor of petroleum; Reese 3, Allen dome, r 1682 ft, td 2230 ft sandy lime. Myers et al's Davidson 1, Clemens dome, dr 855 ft lime. F. A. Bartlett's Dannenbaum 8, Stratton Ridge, sd 3145 ft. Empire O. & G. Co.,'s Brock 1, Stratton Ridge, abn at 2245 ft gyp.

CALHOUN COUNTY—Baker & Thompson's Thomas 1, 9 mi w Pt. Lavaca, dr 2127 ft lime.

CHAMBERS COUNTY—Pure Oil Co.'s Lost River 2, Lost Lake, dr 3570 ft sand and shale; Lost Lake 2, Lost Lake, set surface cas. Mills Bennett's Kirby 2, Barbers Hill, dr 4195 ft rock; Smith 2, Barbers Hill, drk. Gulf's Wilborn 1, Hankamer, dr 480 ft sand. Humphreys Corp.'s Kirby C-1, Barbers Hill, dr 4325 ft sand and lime; Kirby B-6, dr 2235 ft.

COLORADO COUNTY — Rich Oil Corp.'s Brun 1, 3 mi ne Columbus, sd 1215 ft. The Texas Co.'s Hoyo 1, Eagle Lake, abn 1520 ft salt.

FAYETTE COUNTY—Phalen et al's Cervanca 1, 6 mi s La Grange, dr 2688 ft shale. Moore et al's Kerr 1, Muldoon, sd 2078 ft.

FOR BEND COUNTY—Sun Oil Co.'s E. C. Farmer 4, Boling, ru; Kasparek 4, Boling, dr 2615 ft gbo. Gulf's Wilf 13, Long Point, dr 596 ft lime rock; Moore 17, Moore's Field, abn 4195 ft; E. C. Farmer 2, Boling, set cas 3725 ft. Fort Bend Oil Co.'s Moore 1, Orchard, dr 3050 ft hard sand. Scott & Peak's Armstrong 1, Boling, sd 1590 ft. Humble's Dew 1, Sugarland, dr 3397 ft sandy shale; Sugarland Industries 4, Sugarland, dr 2855 ft shale and lime; Deathridge 1, Sugarland, standing 3814 ft; Deathridge 2, ru; Nelson 1, Sugarland, fsh 2990 ft; Camp 2, lcn. J. H. Diehl's Armstrong 1, 2 mi e Boling, sd 500 ft. South Texas Exploration Co.'s Hartsfield 1, Needville, dr 3765 ft rock.

GALVESTON COUNTY—Long et al's Irvin & Bishop 1, 2 mi e Dickinson, dr 4160 ft sand. Republic Prod. Co.'s Lobit 1, 1 mi nw Dickinson, dr 320 ft shale and lime.

GOLIAD COUNTY — J. E. Alexander's Campbell 1, 1 mi n Goliad, sd 825 ft. McCarson et al's Broyles 1, Goliad Townsite, dr 1000 ft gbo. Southern Crude's Patterson 1, 10 mi nw Goliad, dr 710 ft gbo.

HARDIN COUNTY—Chappel Hill Oil Co.'s Hale 1, 5 mi nw Sour Lake, sd 1810 ft. Guedry Drlg. Co.'s Guedry 1, 3 mi s Batson, drk.

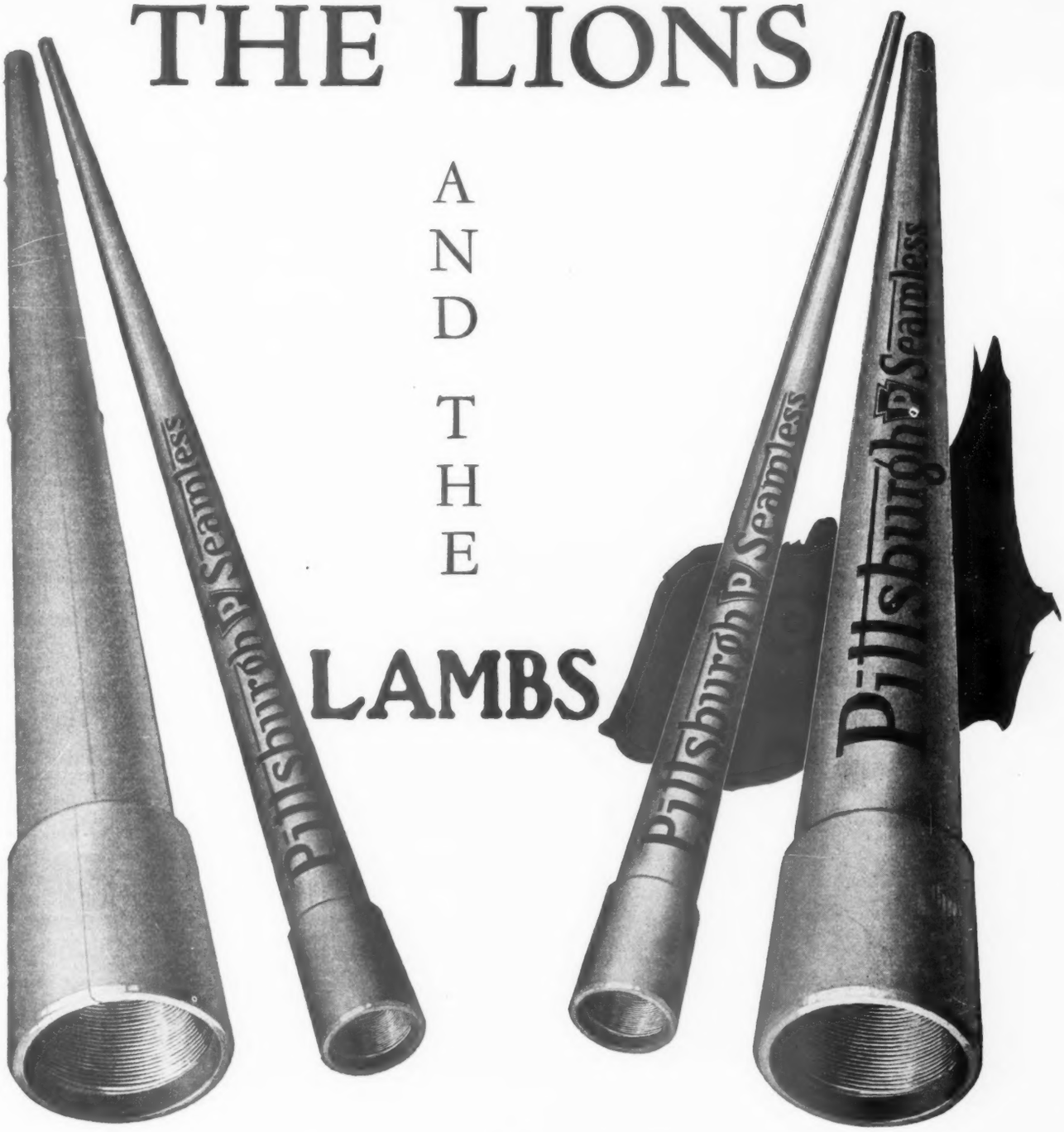
HARRIS COUNTY—Torsen et al's Stewart 1, 4 mi sw Genoa, sd 691 ft. Hunt et al's Lobit 1, 4 mi n Goose Creek, sd 2145 ft. Humble's Warren 5, Hockley, ru; Minnetex 1, Mykawa, dr 4894 ft hard shale; Simms-Smith 74, Goose Creek, dr 5525 ft sandy shale. Cedar Bayou Oil Co.'s Johnson 1, 8 mi n Goose Creek, td 4240 ft. Paxton et al's Brubacker 1, 1 mi ne Clodine, drk. J. A. Shine et al's Kitzman 1, 2 mi n Cypress, dr 2910 ft gbo. Brains et al's Lentze 1, 4 mi s Tom Ball, sd 1120 ft.

JASPER COUNTY—Great Lakes Oil Co.'s Boykin 3, 3 mi ne Rockland, drk. Tar Well Oil Co.'s Mills 1, 3 mi ne Rockland, dr 1763 ft shale and sand. L. A. Painter's Boykin 1, 3 mi ne Rockland, dr 1000 ft gbo.

JACKSON COUNTY — The Texas Co.'s Moore 1, Edna, r 2777 ft. Wright Bros.' Classen 2, Edna, td 3000 ft. Douglas & Lawrence's Lawrence 1, Edna, sd 3020 ft.

JEFFERSON COUNTY — Deep Test Oil Corp.'s McFaddin 1, 1 mi e Spindle Top, sd 2825 ft. Southern Spindle Top O. & Dev. Co.'s Young 1, 1 mi w Nederland, sd 3425 ft. Beaumont Oil Co.'s Tyrrell 1, 2 mi w Brooks, drk. Westbury Spnd's West 1, 1 mi ne Westbury, dr

THE LIONS AND THE LAMBS



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Say you saw it in The OIL WEEKLY

2035 ft gbo. Gulf's Burrell et al 2, Fannette, dr 4875 ft sticky shale. River Oil Co.'s Ship Channel Land Co. 1, 2 mi se Beaumont, dr 632 ft gbo. Bleakie Oil Co.'s Tollivar 1, 2 mi ne Westbury, lcn: The Texas Co.'s Pipkin & Davis 1, Big Hill, dr 1718 ft rock.

LIBERTY COUNTY—Barlow et al's Hinchcliff 1, 2½ mi ne Cleveland, sd 2215 ft. Kouri et al's Campbell 1, 6 mi s Cleveland, sd 2000 ft. Big Dome Interests' Finley 2, 3 mi nw Hardin, drk; Finley 1, 3 mi nw Hardin, sd 4335 ft. The Texas Co.'s Davis 1, Davis Hill, dr 4385 ft sand and shale. Humble's Sterling 3, Moss Bluff, td 2818 ft, trying to mill out back pressure valve; Welder 9, S. Dayton, set screen at 3628 ft, prep to bail. Sun Oil Co.'s Koveleika 1, N. Dayton, dr 2300 ft gbo. Union Explo. Co.'s Esperson 1, 5 mi s Dayton, dr 2820 ft gbo.

MATAGORDA COUNTY — Rycade Oil Corp.'s Hudson-Humble 4, Markham, ru. Crossland et al's Murphy 1, Shepherds Mott, dr 985 ft sandy shale. Dr. P. S. Griffith's Culver 1, e Citrus Grove, fsh 3215 ft; Baer 1, 1½ mi n Gulf Hill, sd 190 ft.

ORANGE COUNTY — Veteran Oil Co.'s Reed 1, 2 mi se Orange fld, dr 2972 ft gbo.

VICTORIA COUNTY—Houston Oil Co.'s McFaddin 2, 11 mi ne Victoria, dr 810 ft gbo.

WASHINGTON COUNTY—Sun Oil Co.'s Marcus 1, Clay Creek dome, 2350 ft hard shale; Einman 1, Clay Creek Dome, dr 2390 ft, sandy shale; Shirmer 2, Clay Creek dome, lcn; Grote 1, Clay Creek, dr 1400 ft sandy shale; Witte 1, Clay Creek, lcn. Davis et al's Seward 1, ½ mi n Independence, ru.

ARKANSAS

ASHLEY COUNTY—Atlantic O. P. Co.'s Moffatt 1, 28-16-8, ds stuck 3951 ft. C. E. Harris et al's Holmes 1, 9-16-7, sd 151 ft.

BRADLEY COUNTY—Ohio Oil Co.'s Sou. Lbr. Co. 2, 19-16-9, rig up.

CLARK COUNTY—Wm. Henry, Tr.'s. Clark 1, 34-9-21, sd 1385 ft.

CALHOUN COUNTY—Joe Hurley's Ark. Land & Timber 1, 29-16-12, setting 12¼-inch csg. 189 ft.

CHICOT COUNTY—W. S. Smith's Meyer 1, 14-19-12, sd 850 ft. Joe Crawford's Cashion 1, 14-18-2, dr 2425 ft. S. D. Hunter's Sawyer 1, 19-18-2, fsh ds 3321 ft.

COLUMBIA COUNTY—G. W. Dawley et al's Fullenwider & Kitchen 1, 12-17-22, wo 2847 ft.

DALLAS COUNTY — Robt. H. Dedman's Hillman 1, 20-10-13, temp. abn 1145 ft.

FALKNER COUNTY—Gold Creek O. & G. Co.'s Stermer 1, 17-4-13, sd 3462 ft.

FRANKLIN COUNTY — Ozark Nat. Gas Co.'s McElroy 1, 15-8-27, lcn.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-3-19w, fsh junk with cable tools 2800 ft.

LOGAN COUNTY—Ark. Nat. Gas Corp.'s W. H. Parks 1, 26-8-24, trying to get by 8-inch casing at 2361 ft, td 3208 ft.

MILLER COUNTY—E. A. Martin, Tr.'s, Dale 4, 23-15-26, cemtd. 12¼-inch casing 84 ft, dr 150 ft.

OUACHITA COUNTY — McDonald Bros.' Wilson 1, 25-15-18, tested for fourbles oil, 1 fourble drilling mud through ds 2805-21 ft corrected measurement, stuck and pulled casing in two while setting 6⅝ casing at 2805 ft, fsh ds and four fourbles ds. Little Fay Oil Co.'s H. Primm 2, 23-15-16, set liner 2050 ft, 36 ft broken sand; H. Primm 3, 24-15-16, dr 750 ft.

UNION COUNTY—Calgo Oil Co.'s Primm 1, 9-18-17, dr 3580 ft. McDonald Bros.' Mayfield 1, 29-19-15, laying fuel line, sd 1990 ft. Stark et al's Powell 1, 35-18-15, tested 24 fourbles sw through ds 2665 to 2673 ft. Imperial O. & G. Co.'s 26-17-16, dr 2997 ft. J. P. Hawkins et al's Godwin 1, 6-17-15, sd 1000 ft. Tharps Drilling Co.'s List 1, 25-17-15, sd 3050 ft. Foster et al's Murphy Land Co. 1, 22-17-17, rig up wo. Grimes Bros.' Hill 2, 7-18-14, rig up wo. Tate & Morefield's W. W. Smith 1, 6-18-13, coring 3130 ft. J. C. Marcum's De Yambert 1, 5-19-4, sd 2025 ft. Sam Sklar, Tr.'s, Fitzgerald 10, 8-18-15, dr 200 ft.

MOUNTAIN STATES

UTAH

BOX ELDER—Utah-Pennsylvanian Oil Co., 1, 3-10n-4w, dr 1600 ft. Leonora. Raddatz Oil Co., 1, 14-9n-8w, dr 2158 ft., 6¼-in set at 1936 ft.

GRAND—Utah Southern, Salt Valley 1, 13-23-21, contr completed to 3000 ft. Utah Southern Shafer La, 36-26-20, sd 2502 ft. Navajo Pet. Co., 2-29-21, dr 2700 ft, gas showing. Intermountain Venture Co., 1, sw 27-21s-19, sd 1602 ft. Big Six Oil Co. and Utah Oil Refining Co., Randall 1, 10-22-19, fsg 1710 ft. Brendell Sons, Crescent Eagle 2, 9-22-19, resuming at 100 ft. Cisco Union O. & G. Co., 20-21-22, spudded.

DUCHESNE—Utah Southern Oil Co., Pleasant Valley 1, 29-4-1, dr 1550 ft.

SAN JUAN—Boulder Knoll O. & G. Co., 17-34-25, prep to resume at 2640 ft. Navajo Pet. Co. of California, 1, 12-35-24, lcn.

UINTAH—Utah Oil Refining Co., 4, 22-5s-22e, 2 M. gas at 1770 ft, 8¼-in set at 1668 ft. Western Venture Corp., Krumvieda 1, se 6-5s-21e, dr 1029 ft. last report. J. F. Walker et al, 1, 18-2n-1e, dr 30 ft.

UTAH—Diamond Oil Co., 3, ne 29-8s-5e, dr 1644 ft.

WAYNE—Phillips Pet. Corp., 1, 16-27-16, dr 3950 ft.

MONTANA

BIG HORN—Texas-Montana Production Co., 2, 21-6s-35e, cem 188 ft.

BROADWATER—New Day Oil Co., 1, ne 29-5n-1e, dr in hole full of water.

BLAINE—Ohio Oil Co., Winngert 1, 3-34n-32e, fsg 2120 ft.

CASCADE—Lone Star Montana Oil Co., sw 13-21-3e, abandoned. Eden Oil & Gas Co., 27-18-4e, dr 670 ft. U. S. Pet. Co., Miller 1, 8-21-4e, wait cas 935 ft. John E. Winther, Power 1, 11-22-1e, dr 1850 ft, more oil and gas showing.

CARBON—Ohio Oil Co., Northern Pacific 1, 11-7s-21e, fsg 4458 ft. Local Oil Co., 1, 25-9s-25e, no report.

CHOTEAU—Geraldine O. & G. Co., ne 1-21-11e, undrr 1250 ft. Williston-Shelby O. & G. Co., Flack 1, 12-28-11e, sd 2675 ft.

CUSTER—Montana Belle, ne 28-8n-45e, dr 1035 ft, oil showing.

FERGUS—Melton Corp., 1, se 24-21n-17e, td 2665 ft. Judith Basin Oil Co., 1, 33-19n-12e, dr 1850 ft.

GALLATIN—California Co., Ringling 1, 35-5n-7e, dr 535 ft.

JUDITH BASIN—Gem Oil Co., 15-16-10e, rig up.

LIBERTY—Sunburst O. & R. Co., Bear's Den 1, nw 17-36-6e, dr 710 ft. Square Deal Pet., Johnson 1, se 1-32-7e, dr 3025 ft. Mid-Rocky Dev. Co., Federal Lands 1, 7-33-73, sd 1500 ft. Western Natural Gas Co., 22-37-4e, dr 1800 ft. Cypress Oil Co., State 1, sw 36-28-6e, sd 450 ft, illness of crew.

MUSSELSHELL—Laffea Oil Co., 1, 6-10n-25e, location.

PONDERA—Trapp Syndicate, Hoover 1, 35-28-15e, dr 1850 ft.

STILLWATER—J. S. Stewart, 5-2n-22e, dr 1400 ft.

SWEETGRASS — Shoshone Consolidated 1, 23-2n-15e, dr 4000 ft.

TETON—Calpet, Eyraud 1, 28-26n-3w, abn. Mitchener et al, Mattoon 1, sw 3-23-1w, dr 1375 ft.

TOOLE—Monalta Oil Co., 1, 1-37-4w, spudding. Wm. J. Maham 1, 10-31-1w, dr 1900 ft.

NEW MEXICO

CHAVES—Snowden & McSweeney, Merchant 1, ne 27-15s-23e, undrr to bottom, td 3458 ft. R. E. Neal et al, Russell 1, 21-14-25e, undrr at 1100 ft. Warman et al 1, sw 23-13s-24e, stand 215 ft.

DeBACA—Matador Oil Co., State 1, sw 6-4n-20e, dr 610 ft. McAdoo Pet. Corp., McAdoo 1, ne 16-1s-27e, ready to resume, td 4190 ft. Transcontinental Oil Co., McWhorter 1, 6-35-22e, dr 850 ft.

GUADALUPE—Navajo Oil Co., Goard 1, 10-3n-17e, dr 2835 ft.

LEA—Midwest Refining Co., Farnsworth 19, 12-26-37w, dr 3841 ft. Marland, Eaves 1, 19-26-37, fsg tools, td 2969 ft. Marland, Sholes 1, 19-25s-37e, fsg tools 3034 ft. Marland, Lynn 1, 26-23-36, 6⅝-in at 3224 ft, sd. Marland, King 1, ne 26-25s-32e, will probably abandon. Marland, Brooks 1, sw 8-20s-33e, fsg 3475 ft. Marland, Danciger 1, 7-23-36e, will probably abandon at 4005 ft. Marland, Reed 1, 22-20s-36e, dr 1100 ft. Marland, Meyers 1, 26-20s-37e, dr 1682 ft. Marland, Warren 1, 29-20-36e, dr 895 ft. Marland, Lockhard 1, 31-21s-36e, dr 1710 ft. Marland, Slattery 1, 7-22s-34e, dr 3710 ft. Gypsy Oil Co., State 1, 34-21s-36e, dr 3720 ft. Exploration Co., Record 1, 26-19s-35e, td 4556 ft. Morton et al, State 1, ne 32-11s-38, sd 100 ft. Texas, Lynch 1, se 34-20-34, ready to spud. Texas, Sheppard 1, ne 6-26s-37e, dr 2970 ft. Texas, Cagle 1, se 9-26s-36e, try kill 75 M. gas at 3175 ft. Texas, Humphreys 1, nw 18-20s-32e, location. Texas, Moberly 1, se 17-26s-37e, wtg parts. Curtis Dr. Co., Nixon 1, 22-18s-34e, wait pipe, td 1150 ft. C. E. Reynolds Dr. Co., Anderson 1, 29-13s-37e, fsg 5260 ft. Cranfill & Reynolds, State 1, se 23-26s-36e, dr 3125 ft. Skelly Oil Co., Joiner 1, se 26-25s-36e, testing, water showing with the production. Hill & Abel, Maechtel 1, sw 5-26s-33e, dr 1000 ft. Maljamar Oil & Gas Corp., Pearsall 2, 30-17s-32e, dr 1300 ft. Empire Gas & Fuel Co., State 1A, nw 12-21s-34e, dr 465 ft. Texas Pacific Coal & Oil Co., State 1, sw 22-23s-36e, rig up. Prairie O. & G. Co., Slattery 1, ne 22-22s-34e, location.

ROOSEVELT—J. T. Keegan et al., Pepper 1, 6-1s-36e, ready to bld rig. Smith & Sloan, lovern 1, se 4-3s-35e, location.

SAN JUAN—Continental Oil Co., Munoz 17, 2-29-19, sidetr tools, td 6338 ft. Dorothy Oil Co., 29-30-9, sd temporarily at 712 ft. Huerfano Oil Co., Wiltbank 1, 25-29-11, stndg 800 ft. San Juan Pet. Co., 1, 9-29-14w, sd 2950 ft. Kirtland Dr. Co., Hunt 1, 10-29-15, td 450 ft. Kutz Canon O. & G. Co., Day 1, 29-28-11, dr 515 ft. Midwest Refining Co., State 1, se 36-22n-14w, dr 3075 ft. Blackrock Oil Co., 1, sw 11-25n-14w, dr 1520 ft. Iowa Oil Synd., Viles 2, 28-29-11, dr 790 ft. Angel Peaks Oil Co., Kutz Canon 1, 11-28n-11w, undrr to 1420 ft. R. R. Burke et al, Deneen 1, 18-21-13, sd 1006 ft. Hall et al, 1, 31-22n-13w, sd 507 ft. Milwaukee-New Mexico Syndicate, Beardsley 1, 30-28n-11w, dr 1100 ft.

SAN MIGUEL—E. Adams et al, Deason 1, 14-15n-16e, sd 1235 ft. Benedict Wilson 1, ne 25-17n-16e, dr 745 ft.

SOCORRO—Arnold et al, 2, ne 13-6s-1w, dr 1345 ft.

TORRANCE—Bluhall O. & G. Co., 20-6n-10e, wtg cas at 1444 ft. Hall et al, Pinos Wells 1, sw 25-3n-13e, stndg 400 ft. Sinnock et al, Kutchin 1, ne 13-7n-7e, ready to spud.

VALENCIA—Acme Oil Co., New Mexico-Arizona Land Co., 1, 26-6-3, try to lower casing. Rio Puerco Oil Co., New Mexico-Arizona Land Co., 2, nw 13-6n-2w, wait pipe at 3145 ft.

WYOMING

ALBANY—Union of California, 1, 1-16-76, stand cem at 1535 ft.

BIG HORN—Utah Southern Oil Co., 3, 26-56n-97w, prep to test at 3765 ft. Producers & Refiners, 3, 24-56-98, chang to rotary, td 2708 ft. Prairie Oil & Gas Co., Chilcote 1, 35-56n-95w, dr 1450 ft. P & R, South Frannie 1, 7-57-97, cem 12½-in at 1200 ft.

CARBON—P & R, No. 3, 2-19-88, dr on iron 3918 ft, td 4003 ft. P & R, O'Brien Springs 5, 12-24-88, rigging. Graybeal Synd., 16-28-81, prep to recem 4000 ft. Producers Oil Corp. and Redfeather Oil Co., se 35-12-92w, ready to resume, td 1005 ft.

FREMONT—P & R, Muskrat 2, nw 1-33n-92w, location. Gates & Holman, 6-33-94, material on location. Kinney-Coastal 1, 22-3n-1w, rig up.

HOT SPRINGS—Texas Prod. Co., sw 23-45n-100w, dr 200 ft. Westland Oils, Inc., 23-44n-95, rig.

JOHNSON—Matthew Foreman et al, Crazy Woman 1, 7-47-82, will abandon old well and drill new rotary test.

LINCOLN—Midwest Refining Co., Waterfall 1, 35-22-115, sd 1765 ft, dr water well. Midwest Refining Co., Little Grey's River 1, 25-37-113, dr 730 ft, boiler trouble.

PARK—California Exploration Co. and P & R, Pitchfolk 1, 14-48n-102w, cemented 20-in at 225 ft. Resolute Oil Co., nw 17-57-101, dr 190 ft. Cody Pet., Nelson 1, 4-51-102, stand 1065 ft. Oregon-Wyoming Oil Co., 1, sw 30-52-101, dr 1100 ft. Ohio Oil Co., Pulley 1, 27-53-101, dr out cem at 4752 ft. Lenco Oil Co., Pulley 1, 25-53-101, dr 400 ft. California Exploration Co., 1, 29-48-103, sd new well at 200 ft. Gebo Royalty Inc., ne 17-57-101, dr 1140 ft.

SWEETWATER—Prairie O. & G. Co., Tucker 1, 18-13-99, ur 2380 ft. Ohio Oil Co., Humphreys 1, 2-12-101, dr 1050 ft. Sormir Pet. Co., 13-21-100, stand 1335 ft.

SUBLETTE—California Co., Wyss 1, 12-32n-115w, sidetr bid, td 1010 ft. California Co., Buchell 1, 11-29-115, dr 2221 ft.

UINTA—California Co., U. P. L., 7-17-116w, dr 2086 ft.

WESTON—Wyoming Drilling Synd., ne 15-44n-64w, dr 4300 ft.

OKLAHOMA

WOODS COUNTY—T 28n, R 18w, Sec. 11, George Vincent et al's Freedom 1, c sw, ponds.

GRANT COUNTY—T 28n, R 3w, Sec. 24, Lario O. & G. Co. et al's Connell 1, nwc, moving in tools.

HARPER COUNTY—T 27n, R 21w, Sec. 24, A. F. Kopisch Oil Co.'s Selman 1, nec se, spdded and sd.

WOODS COUNTY—T 27n, R15w, Sec. 20, Sooner State Oil Co. & E. R. Black's Marcum 1, c sw, spudded and sd.

GRANT COUNTY—T 26n, R 4w, Sec. 34, Sooner State Oil Co.'s Royce 1, swc nw, sd 550 ft.

KAY COUNTY—T 26n, R 2e, Sec. 32, J. A. Vincent & natl. Union's McNeal 1, nwc ne, sd 2795 ft.

HARPER COUNTY—T 25n, R 22w, Sec. 14, Hoffer Oil Co.'s Cooper 1, nwc se, sd 4182 ft, litigation.

WOODS COUNTY—T 25n, R 15w, Sec. 10, Bu Vi Bar et al's 1, sec sw, bldg rig.

GRANT COUNTY—T 25n, R 4w, Sec. 22, Cowden's Vollner 1, nec se ne sw, lost tools 5640 ft, sd.

TEXAS COUNTY—T 1n, R 18 E.C.M., Sec. 11, Three Way Oil Co.'s Price 1, sec nw, hfw 3490 ft, sd.

WOODWARD COUNTY — T 24n, R 17w, Sec. 32, Otstot Dev. Co.'s Simmons 1, sec, sd 1500 ft.

WOODS COUNTY—T 42n, R 13w, Sec. 18, Miller et al's Copenhaver 1, nwc, spudded and sd.

GARFIELD COUNTY—T 24n, R 6w, Sec. 9, Pulse & Beamer's White 1, sec nw, sd 4755 ft.

WOODWARD COUNTY—T 23n, R 20w, Sec. 9, Billy Oil Co.'s Wyatt 1, c se, dr 550 ft. T 21n, R 21w, Sec. 25, Sharons Elmore 1, swc, sd 3025 ft, rig blown down.

MAJOR COUNTY—T 20n, R 14w, Sec. 23, Keller et al's Horton 1, c ne ne, spudded and sd.

GARFIELD COUNTY—T 20n, R 4w, Sec. 9, Marland Oil Co.'s Looman 1, nec se, sd 5735 ft, casing parted. Sec. 12, Marland Oil Co.'s Miller 1, swc, hfw 4586 ft, sd.

DEWEY COUNTY—T 18n, R 15w, Sec. 9, Huckelby & McCoy's Perfect 1, nec, sd 4395 ft.

LOGAN COUNTY—T 18n, R 3w, Sec. 33, Haley and Consolidated Drlg. Co.'s Quier 1, sec sw, fsh 3970 ft. T 18n, R 2w, Sec. 21, Tibbets & Bond's Oonahue 1, swc nw se, show of oil at 5395-5405 ft, dr 5725 ft.

KINGFISHER COUNTY — T 16n, R 6w, Sec. 27, Crawford & McKenna's Sturgeon 1, nec sw, dr 4846 ft.

BLAINE COUNTY—T 15n, R 12w, Sec. 26, W. J. Donley's Dickens 1, sec ne, dr 4236 ft.

CANADIAN COUNTY—T 14n, R 6w, Sec. 9, A. D. Spears' Piatt 1, swc ne, sd 3223 ft.

OKLAHOMA COUNTY—T 13n, R 3w, Sec. 18, Slick and Bailey's Lufkin 1, c ne se, sd 4510 ft. T 12n, R 3w, Sec. 15, Cromwell et al's Thompson 1, swc ne ne, sd 7001 ft. T 11n, R 3w, Sec. 24, I. T. I. O. Co.'s Park 1, c se se, est 40M gas 4793-4816 ft, td 6402 ft, dr out cemt.

CANADIAN COUNTY—T 10n, R 6w, Sec. 1, J. V. Bailey's Robinson 1, c ne nw, spudded and sd.

OSAGE COUNTY—T 26n, R 6e, Sec. 25, White Eagle O. & R. Co.'s 1, swc ne, dr 1190 ft. T 22n, R 8e, Sec. 8, Harry McGill's 1, swc se, ur 10-inch 1210 ft td.

PAWNEE COUNTY—T 22n, R 5e, Sec. 33, Washoma O. & G. Co.'s Buffalo 1, sec nw, dr 3358 ft.

LINCOLN COUNTY—T 16n, R 4e, Sec. 15, J. V. Bailey et al's House 1, c ne se, dr 3020 ft. T 16n, R 6e, Sec. 19, Morgan & Flynn's Finley 1, swc, lcn. T 15n, R 6e, Sec. 23, Shaffer O. & R. Co. et al's Pinkston 1, nec sw, td 2873 ft, cemt 8-inch. T 12n, R 3e, Sec. 29, Phillips Pet. Co.'s Roberson 1, sec nw, rig. T 12n, R 6e, Sec. 10, Kingwood Oil Co.'s Jennings 1, swc, dr 4460 ft.

CREEK COUNTY—T 14n, R 9e, Sec. 1, Shaffer O. & R. Co.'s Polk 1, nwc ne se, Wilcox 3479-89 ft, hfw, sd. Sec. 10, Transcontinental Oil Co.'s Taylor 1, nwc sw se se, dr 1625 ft. Sec. 26, T. Kelley et al's Anderson 1, swc se, rig.

OKFUSKEE COUNTY—T 12n, R 9e, Sec. 30, Tidal Oil Co. et al's Barnett 1, sec ne ne, dr 850 ft.

MUSKOGEE COUNTY—T 13n, R 18e, Sec.

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33, L. T. Haynie's Linder 1, c se, show gas 2200-49 ft, sd 2298 ft.

McINTOSH COUNTY—T 12n, R 18e, Sec. 15, A. B. Wolfe et al's Beck 1, nwc se, spudded and sd.

PITTSBURGH COUNTY—T 9n, R 16e, Sec. 32. Pattison et al's McDuff 1, swc nw se, 3M gas 4613-35 ft, Wilcox 5443-58 ft dr.

HASKELL COUNTY—T 9n, R 18e, Sec. 10, Marion Oil Co.'s Sanders 1, nwc ne sw, rebuilt rig 1800 ft, sd.

PITTSBURGH COUNTY—T 6n, R 14e, Sec. 7, McAylor et al's Reed 1, nwc sw nw, sd 1103 ft.

LATIMER COUNTY—T 5n, R 18e, Sec. 15, Limestone O. & G. Co.'s Murray 1, swc, 1½M gas 2518-22 ft, fsh tools.

SEMINOLE COUNTY—T 11n, R 6e, Sec. 27, Fuhrman Pet. Co.'s Fay 1, sec nw sw, Hunton lime 4422-4600 ft, hfw, dr 4635 ft.

OKFUSKEE COUNTY—T 11n, R 7e, Sec. 21, T. B. Slick's Wolfe 1, sec ne se, sd 1560 ft.

SEMINOLE COUNTY—T 11n, R 7e, Sec. 34, Phillips Pet. Co.'s Mil 1, nwc sw, fsh 2765 ft, T 10n, R 7e, Sec. 5, Marland Oil Co.'s Strathers 1, nwc se ne, dr 2375 ft. Sec. 18, Shaffer O. & R. Co. et al's Jones 1, swc ne, ts 4705-10 ft, hfw, pb 3715 ft sd.

POTTAWATOMIE COUNTY—T 9n, R 4e, Sec. 11, Atlantic & Phillips' Bank 1, swc ne ne, cemt 8-inch 4250 ft. T 9n, R 5e, Sec. 30, Magnolia Pet. Co.'s Germany 1, sec nw, top Sylvan sh. 4207 ft, dr 4290 ft 1400 ft oil and 200 ft water in hole. T 8n, R 2e, Sec. 24, Superior Oil Corp.'s Jones 1, swc nw ne, top Hunton 4918 ft, td 4957 ft, showoil,fsh 5-inch csg. T 8n, R 3e, Sec. 12, T. B. Slick's Nix 1, sec nw nw, dr 1350 ft. T 8n, R 4e, Sec. 15, Phillips Pet. Co.'s Sparkman 1, sec sw, dr 4543 ft.

SEMINOLE COUNTY—T 8n, R 8e, Sec. 4, McCullough's McGilbray 1, swc ne, dr 1265 ft, hfw.

HUGHES COUNTY—T 8n, R 9e, Sec. 18, Pure Oil Co.'s Fixico 1, nec sw, top Wilcox 4426 ft, dr 4436 ft, 300 ft water in hole. T 8n, R 10e, Sec. 7, Bauer et al's Penn 1, nwc sw ne, top Sylvan 4098 ft, sg 6-inch 4120 ft.

CLEVELAND COUNTY—T 7n, R 1w, Sec. 15, Sooner Oil Co.'s Vandeveer 1, nec nw sw, sd 3120 ft.

POTTAWATOMIE COUNTY—T 7n, R 2e, Sec. 17, T. B. Slick's Spangler 1, nwc se nw nw, cemtg cave at 5520 ft. T 7n, R 5e, Sec. 14, Champlin Ref. Co.'s Harber 1, swc ne sw, dr 4140 ft.

POTTAWATOMIE COUNTY—T 6n, R 5e, Sec. 17, Roxana Pet. Corp. et al's Lowe 1, swc nw ne, cemtg 8-inch 3995 ft.

McCLAIN COUNTY—T 5n, R 3e, Sec. 29, Empire's Bonner 1, se nw nw, dr 3368 ft.

SEMINOLE COUNTY—T 5n, R 6e, Sec. 11, T. B. Slick's Harjo 1, nwc ne, dr 3820 ft.

HUGHES COUNTY—T 5n, R 9e, Sec. 17, E. W. Whitney's Huddleston 1, sec sw, show oil 2745-55 ft, 3000 ft ur 6-inch.

GARVIN COUNTY—T 4n, R 3e, Sec. 10, Garland Oil Co.'s Strickland 1, sw nw sw, dr 3468 ft.

PONTOTOC COUNTY—T 4n, R 4e, Sec. 20, Roxana Pet. Corp.'s Smith 1, nwc sw, dr 2260 ft. T 4n, R 8e, Sec. 23, Independent's Hampton 1, nec se, lcn.

COAL COUNTY—T 2n, R 8e, Sec. 5, Wichtex Oil Co.'s Folsom 1, c nw nw, lcn abn.

MURRAY COUNTY—T 1n, R 2e, Sec. 17, Revels & McGee's Wolfe 1, nwc, ur 10-inch csg 1500 ft.

COAL COUNTY—T 1n, R 8e, Sec. 35, W. E. McGraw et al's Patton 1, swc se ne, td 4793 ft hfw, pb to 1940 ft, shot 30 qts 1850-1885 ft, flows 10 bbls 48 grav, complete. T 1n, R 9e, Sec. 24, Galbreath et al's Jones 1, swc se, sd 2505 ft.

CUSTER COUNTY—T 14n, R 14w, Sec. 1, W. E. Witt's Wellman 1, c se, sd 100 ft.

CADDO COUNTY—T 12n, R 11w, Sec. 15, Abernathy & Ashton's 1, c nw, dr 4565 ft.

ROGER MILLS COUNTY—T 11n, R 26w, Sec. 4, L. C. Hivick's Davis 1, c nw ne, sd 700 ft.

BECKHAM COUNTY—T 8n, R 25w, Sec. 1, E. L. Martin's Daly 1, c nw se, dr 2055 ft. T 8n, R 21w, Sec. 33, Day Oil Co.'s Ault 1, c nw nw, dr 575 ft.

KIOWA COUNTY—T 7n, R 16w, Sec. 26, Connor & Son's Geis 1, sec nw ne, sd 1712 ft to standardize. T 7n, R 15w, Sec. 35, Davis Malernee's Van Kirklan 1, nwc sd, 858 ft. T 6n, R 16w, Sec. 18, Alexander et al's Fuqua 1, swc ne, owdd, sand 428-440 ft, pumped 225 bbls in 31 hours, sd for new equipment. T 6n, R 15w, Sec. 6, Johnson McDowell's 1, c sw ne, sd 2160 ft.

KIOWA COUNTY—T 6n, R 14w, Sec. 31, Sloan et al's Sloan 1, ne cor, lcn.

CADDO COUNTY—T 6n, R 12w, Sec. 29, W. J. Hortley's Gilbreath 1, se cor nw se, owdd, sd 3394 ft.

KIOWA COUNTY—T 5n, R 14w, Sec. 6, Russell & Sloan's Rushton 1, ne cor sw se, sd 1655 ft.

GRADY COUNTY—T 5n, R 6w, Sec. 31, Wirt Franklin's Long 1, sw cor ne, lcn abn.

COMANCHE COUNTY—T 4n, R 11w, Sec. 2, Wirt Franklin's Hollow 1, nw cor, sd 1472 ft show gas 1446-63 ft.

JACKSON COUNTY—T 1n, R 20w, Sec. 4, Houseman et al's Northington 1, ne cor, dr 1906 ft.

KIOWA COUNTY—T 1n, R 17w, Sec. 13, Allen Bros.' Howell 1, nw cor se, dr 250 ft.

STEPHENS COUNTY—T 1n, R 7w, Sec. 2, Stahl & Burris' Jefferson 1, se cor ne nw, sd 2389 ft.

JACKSON COUNTY—T 1s, R 20w, Sec. 33, Stanley McGregor's 1, sw cor nw sw, dr 2215 ft.

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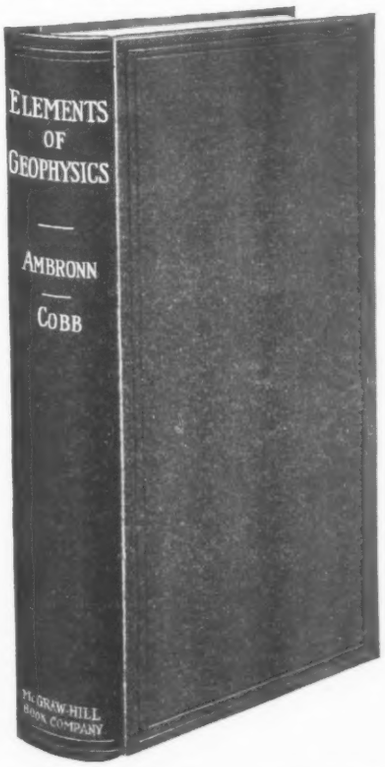

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STEPHENS COUNTY—T 1s, R 7w, Sec. 12, Ilsing, Russell & Nance's Houston 1, ne cor sw sw gas sand 1645-48 ft, coring.

KIOWA COUNTY—T 2s, R 16w, Sec. 6, Landfair's 1, se cor sw se, dr 2535 ft.

TILLMAN COUNTY—T 3s, R 18w, Sec. 29, Dixie Oil Co.'s Harrison 1, ne cor nw, sd 50 ft.

COTTON COUNTY—T 3s, R 10w, Sec. 11, E. J. Stumpf's Jones 1, nw cor ne, lcn.

STEPHENS COUNTY—T 3s, R 8w, Sec. 26, E. J. Stumpf's Simon 1, sw cor, rig.

COTTON COUNTY—T 4s, R 12w, Sec. 16, Guiler & Pyson's Thomas 1, se cor sw, show oil and gas 1252-54 ft, sd 1930 ft.

TILLMAN COUNTY—T 5s, R 15w, Sec. 3, A. M. Pearson's Indian 2, sw cor, (twin No. 1), dr 3085 ft.

JOHNSTON COUNTY—T 1s, R 7e, Sec. 29, Smithy & Kinsley's Lane 1, se cor nw, sd 1306 ft.

CARTER COUNTY—T 4s, R 2e, Sec. 32, Texokla Drlg. Co.'s Anderson 1, se ne se, rur. T 5s, R 3w, Sec. 19, Devonian Oil Co.'s Myer 1, nw cor se, bldg rig.

BRYAN COUNTY—T 9s, R 9e, Sec. 36, W. G. Endicott's Craig 1, c nw ne, dr 480 ft.

SOUTHERN CALIFORNIA

BELLFLOWER—Dollar Oil Co.'s Blythe 1, co 2900 ft, will deepen.

CALABASAS—Easton & Smith's Morrison 1, sd 2955 ft.

CHATSWORTH—Russell Pet. Co.'s Joughin 2, sd 625 ft, will resume operations.

COSTA MESA—Mesa Pet. Corp.'s B. G. 1, dr sand 3275 ft.

DAVIDSON—California Well Drilling Co.'s Del Amo 1, sd 7660 ft.

DOWNEY—Associated Oil Co.'s Taylor 1, dr sand 5150 ft.

FULLERTON—Shell's Stern 1-1, pumping 100 bbls, td 6300 ft.

GARDEN GROVE—The Texas Co.'s Crawford 1, dr sand and shale 1700 ft.

HUNTINGTON BEACH—Western Drilling & Producing Co.'s Pacific 1, oil showings, td 3120 ft.

INGLEWOOD—Ring Pet. Corp.'s Simons 1, sd 4350 ft. California-Eastern Oil Co.'s Community 1, rig.

MAYWOOD—Richfield's Community 1, rig.

MONTEREY PARK — Monterey Park Pet. Co.'s Jepson 1, dr sand 3975 ft.

NEWHALL — California-Eastern Oil Co.'s Hasley 1, dr shale 2300 ft.

POMONA—Pomona Oil Assn.'s Community 1, fsh for tools 925 ft.

PUENTE—Richfield's Didier 1, dr sand and shale 2600 ft.

RIVERA—Empire Drilling Co.'s Furman 1, will deepen from 4500 ft.

SAN FERNANDO—Shell's Mission 2, dr sand and shale 5700 ft.

STANTON—Fred F. Steele's Everhard 1, rig.

RIVERSIDE COUNTY — Hall Pet. Co.'s Watt 1, dr rock 900 ft.

SAN BERNARDINO COUNTY — Western Pacific Oil Co.'s 3, sd 3220 ft.

SAN DIEGO COUNTY—Stanley S. Turner's Baler 1, co 1500 ft, td 1530 ft.

NORTHERN CALIFORNIA

Completions

Company, Well and Location	Initial Production Bbls.	Depth
VENTURA COUNTY—		
R. E. Burke's McDonnell 1, 11-4-23	*	2960
SAN MATEO COUNTY—		
Shell's Cowell 2, 8-6-5	*	3690

KERN COUNTY

BUTTONWILLOW — Milham Exploration Co.'s Wisnom 1, 16-28-23, sd 4510 ft. Doheny-Stone Drilling Corp.'s Salisbury 1, 7-29-24, re-dr 4175 ft, td 4260 ft. Southern California Gas Co.'s 1, 4-28-23, sd 4270 ft; No. 1, 10-28-23, new lcn; Wisnom 1, 27-28-23, new lcn.

COMANCHE POINT—W. W. Stabler's Tejon 1, 23-32-29, 10-in cas cmt 2520 ft, td 2890 ft.

EDISON—General Pet. Corp.'s Seale 10, dr sand 2840 ft.

GOULD HILLS—Elmer Oil Co.'s 1, 2-29-20, dr shale 666 ft. Exeter Oil Co.'s Pray 2, making prod test, td 785 ft. Ozena Oil Co.'s 1, 27-29-21, flowing water and small percentage of oil.

McKITTRICK—Abbott Pet. Co.'s 1, 2-30-21,

co 1940 ft. McKittrick Hills Oil Co.'s Vail 1, 18-30-22, making test, td 3250 ft.

SHALE HILLS—M. M. Young's 1, 6-27-19, new lcn.

RIO BRAVO—Elmer Oil Co.'s 1, 8-28-25, dr shale and sand 4576 ft.

SAN EMIDIO — Standard's 1, 35-11-22, dr shale 3398 ft.

SEMITROPIC—Richfield's Kerwin 1, 21-26-22, dr hard sand 4675 ft.

SANTA BARBARA COUNTY

CARPENTERIA—Continental's 1, sd 2200 ft.

SANTA BARBARA—Channell Oil & Development Co.'s 1, 29-4-27, pumping water and oil, td 6290 ft. Shell's Rutherford 1, rig.

TORTUGA CANYON—Standard's Schyvers 1, rig.

POINT ARQUELLO—Standard's Sudden 1, bldg rig.

VENTURA COUNTY

BARDSDALE — Triple A Investment Co.'s Elkins 1, 28-4-19, trying for water shutoff, td 2950 ft.

FILLMORE—Sespe Oil Co.'s Smith 2, co 4000 ft.

OJAI—Continental's Fox 1-M, 21-4-22, dr brown shale 2650 ft; Thompson 1, 22-4-22, rigging rotary, td 2810 ft.

PIRU—Bolsa Chica Oil Co.'s Hidden 1, 5-4-18, new lcn. Border Oil Co.'s 1, 8-5-19, dr 965 ft. Petroleum Securities Co.'s Diablo 1, 26-5-10, dr gray sand 6483 ft.

SANTA PAULA—W. W. Bryant's 1, 21-4-21, sd 750 ft; 3, 21-4-21, dr shale 525 ft. San Pedro-Pt. Fermin Synd.'s Kellerman 1, 13-3-21, sr 608 ft, td 675 ft.

SATICOY—Standard's Citrus 5, 10-2-22, dr gray sand 3275 ft.

SIMI—Emma F. Exline's Seaton 1, 32-5-21, fsh for dr pipe 2410 ft. Pirate Oil Co.'s 1, 33-3-21, rig. Shell's Marr 1, 31-3-17, rigging up.

SOUTH MOUNTAIN — Ring Pet. Co.'s Converse 1, dr gray sand 4835 ft.

MISCELLANEOUS

FRESNO COUNTY—Currency Pet. Co.'s 1, 28-21-14, dr 410 ft, cable tools. Fresno-Madera Synd.'s 18-12-21, dr gray sand 4166 ft. Ellerby & Justice's Boatright 1, 27-19-19, dr 150 ft.

MADERA COUNTY—Madera-Los Angeles Synd.'s 2, 21-10-17, dr 2650 ft.

MENDOCINO COUNTY—Fred Whited's 2, 29-19-13, gas showing 512 ft.

MERCED—Delhi Leasing & Drilling Co.'s 1, 19-16-11, dr 1100 ft. H. L. Kune's 2, 5-12-9, dr 720 ft.

SAN LUIS OBISPO COUNTY—Panorama Oil Co.'s 1, 7-31-21, ur 3160 ft. Union's Russ 1, 34-32-15, dr shale 3300 ft; Chandler 1, 12-32-15, dr sand 2342 ft.

SONOMA COUNTY—Shell's Doss 1, 29-5-6, dr gray sand 1725 ft.

TULARE COUNTY—Angiola Dev. Co.'s 1, 27-22-23, rigging up. Big Four Drilling Co.'s 1, 29-23-27, testing 4330 ft. Kings-Tulare Synd.'s 1, 19-21-23, co 2700 ft, td 5650 ft.

NORTH LOUISIANA

Completions

Company, Well and Location	Initial Production Bbls.	Depth
BIENVILLE PARISH—		
Baca Drilling Co., State 1, 16-16-10	*	2561
BOSSIER PARISH—		
Northwest La. Gas Co., Pinewoods Lbr. Co. 7, 33-23-11	35	3041
SABINE PARISH—		
R. L. Gay, Trustee, Bowman-Hicks 2, 14-7-14	50	2130
UNION PARISH—		
R. W. Rhodes, Upshaw 1, 14-23-2w	*	....
WEBSTER PARISH—		
Northwest La. Gas Co., Pinewoods Lbr. Co. 8, 37-23-11	*	3418

BIENVILLE PARISH—W. G. Gray, Tr.'s, Johnson 1, 21-18-6, dr 2324 ft. W. P. Wallace's Ashley 1, 15-16-10, rig up. Baca Drilling Co.'s State 1, 16-16-10, dry abn 2561 ft.

BOSSIER PARISH — Big Ben Oil Co.'s Stewart 2, 15-18-12, rig up wods. Doern et al's Bolinger 1, 9-22-11, sd 4317 ft. Nell & Lanier's Biedenharn 1, 23-21-14, lcn. Triangle Drilling Co.'s Bulkley 1, 9-20-13, dr 4392 ft. Walker et al's Antrim 1, 28-22-13, arr to set csg td 2985 ft. Northwest La. Gas Co.'s Pinewoods Lbr. Co. 7, 33-23-11, 35 bbls 3041 ft.

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More than 20 Diamond Drills Testing Structure

The new oil field at Wichita, Kansas, is being mapped out rapidly. Geologists are seeking favorable locations economically, without guess work. Trends are being defined, and "sub-surface highs" determined, by diamond core drills. For more than twenty Sullivan Diamond Drills were brought in by large oil companies at the start, to test the structure.

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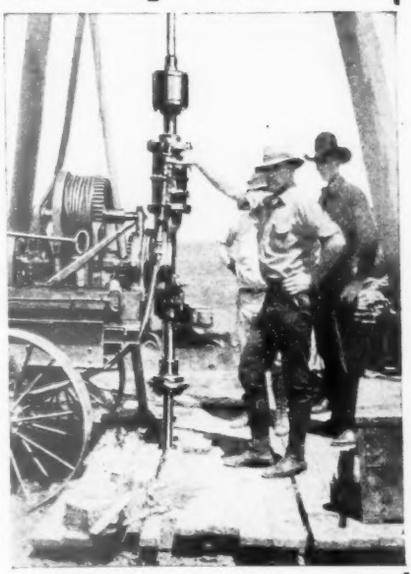

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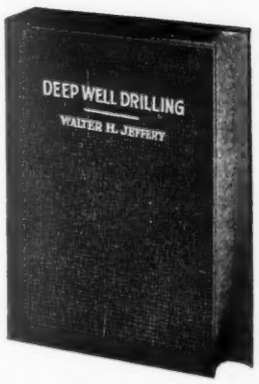

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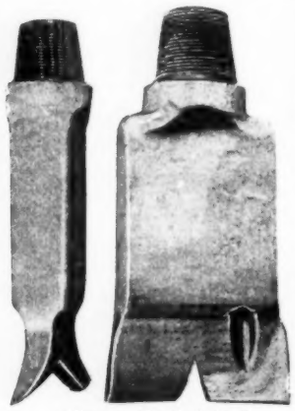

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Oakwood No. 13, Spindletop. Drilled to 4753 feet; 22 APPLEMAN GUMBO BITS used in drilling the deeper part of the hole—from 2595 feet to 4753 feet; Even taking an average from the deep part of the hole, the bits average 98 feet each at a cost of 12 cents per foot.

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B.K.APPLEMAN

BEAUMONT, TEXAS

CADDO PARISH—Tidal Oil Co.'s McGrary 1, 23-19-16, dr 1770 ft.

CATAHOULA PARISH—Lochnager O. & G. Co.'s Taliaferro 1, 26-9-6e, sd 900 ft.

CLAIBORNE PARISH—Dixie Oil Co.'s Gilbert 1, 27-21-5w, flowing sw, lost csg seat, setting full string 6⅝, td 4205 ft. El Dorado Chief Oil Co.'s Baker 1, 26-20-7, sd for ds, td 2086 ft. Smitherman & McDonald's Miller 1, 17-23-8, dr 4060 ft.

DE SOTO PARISH — Benedum & Trees' State 1, 22-14-12, cmtd 9-inch csg making 25 mil ft gas 100 bbls sw, td 2631 ft, may deepen. Benson O. & G. Co.'s Jackson 1, 3-10-13, rig up. Luke Case, Tr.'s, Boatrnght 1, 3-10-13, dr 925 ft. Carlton Drilling Co.'s Stephens 2, 12-11-16, sd 350 ft. R. O. Roy's Sample 1, 1-13-14, rig up. Whittaker 1, 4-13-13, arr to deepen 2834 ft. Thorn Oil Co.'s Burford 1, 22-14-14, rig up. Warren & Carruthers' Ramsey 1, 33-13-16, sd 2100 ft.

EAST CARROLL PARISH—Palmer Corp.'s Carroll Land Co. 1, 21-19-11e, temp abn 3141 ft.

FRANKLIN PARISH—Davis et al's Moore 1, 12-11-6e, sd 1000 ft.

MADISON PARISH — Mid-American Pet. Co.'s Yerger 1, 51-16-14e, sd 285 ft.

NATCHITOCHES PARISH—Robeline O. & G. Co.'s Cassady 1, 7-8-9w, sd 1100 ft.

OUACHITA PARISH—G. E. Jordan's Wall 1, 12-18-3e, tested show gas 3274 ft. Ouachita Nat. Gas Co.'s D'Arbonne B-2, 25-19-2e, dr 3202 ft. Phillips et al's School Fee 1, 16-16-4e, dr 2221 ft.

RAPIDES PARISH—G. E. Silbertson's Willemach 3, 13-5n-4w, sd 2250 ft. Glenmora Pet. Co.'s Fee 1, 1-2n-2w, sd 3850 ft.

RED RIVER PARISH — Rock Pet. Co.'s Pierson 1, 12-14-11, will pump, td 1761 ft, nine ft sand.

RICHLAND PARISH—Ruston Drilling Co.'s Eteridge 1, 28-17-6e, lcn. Wilson et al's Buie 1, 17-15-7e, lcn.

SABINE PARISH—Doern et al's Pickering Lbr. Co. 1, 17-4-11, dr 4447 ft. Texas Co.'s Hamlin 1, 28-10-13, dr 4145 ft. R. L. Gay, Tr.'s, Bowman-Hicks 2, 14-7-14, flowing 50 bbls oil, td 2130 ft.

TENSAS PARISH—Enochs et al's Curry 1, 39-11-12e, sd 3583 ft.

UNION PARISH—G. E. Carmatte's Tugwell 2, 21-22-1e, moving in rig. Carter & Wingfield's Clark A-3, 8-23-1e, dk. Hudson 2, 7-23-1e, sd 2190 ft; Hudson 3, sd wo 2278 ft; Security Trust 2, 7-23-1e, lcn; Security Trust 3, 23-23-1w, dr 3185 ft. H. C. McDonald, Union Sawmill 2, 18-23-1e, dr 1000 ft. R. W. Rhodes, Upshaw 1, 14-23-2w, lcn abn.

WEBSTER PARISH—Jones et al's Elkins 1, 33-23-9, temp abn, 2690 ft. Magnolia Pet. Co.'s H. H. Branton 1, 5-22-9, dr 586 ft; M. Branton 1, 5-22-9, dr 1925 ft; Scroggins 1, 1-22-11, set 8⅛-inch csg 2690 ft. Harry Morris' Lewis 1, 15-23-9, sd 2902 ft. Northwest La. Gas Co.'s Pinewoods Lbr. Co. 8, 37-23-11, sw abn, td 3418 ft.

KANSAS

BARBER COUNTY — Barbara Oil Co.'s Blunk 1, c ne nw 20-34-13w, st reaming 4755 ft.

BARTON COUNTY—McJilton et al's Evanston 1, se nw 34-17-11w, rig.

BUTLER COUNTY—LaRobb et al's Bronsenger 1, ne sw 24-27-3, ru.

CHASE COUNTY—Griener & Fowler's Carson 1, ne ne 9-21-7, sd 3150 ft.

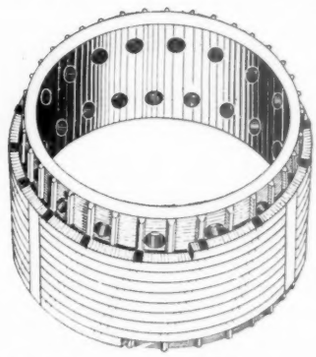
CLAY COUNTY — Roth & Faurot's Bradbery 1, se nw 21-9-4e, sd 1775 ft.

COWLEY COUNTY—Pyle & Sutter's Lindstrum 1, se ne 9-35-4e, fsh 900 ft. Empire-Marland-Twin State's Feaster 1, nw ne 36-32-5e, dr 2265 ft. Wakefield & Osborne's Osborne 1, nw ne 18-30-5, rig.

EDWARDS COUNTY—Amerada-Wilcox O. & G. Co.'s Teansil 1, nw cor 32-25-19w, dr 3770 ft.

ELLIS COUNTY—Rush Oil Co.'s Gatewood 1, nw nw 4-15-20w, sd 1100 ft. Empire's Wann 1, ne 31-12-19w, dr 2985 ft. Marland's Vine 1, sw se 27-11-19w, dr 2955 ft. Transcontinental's Boetcher 1, nw se sw 21-13-19w, sd 3558 ft. Phillips' Brull 1, c nw¼ 34-14-17w, spudded, sd. Phillips' Shutts 1, c ne¼ 5-12-17w, sd 3575 ft, est 350 bbls; Schmeidler 1, nw cor 20-12-17w, rig. Labette Oil Co.'s Urbank 1, ne nw nw 19-15-16w, sd 3060 ft. T. B. Slick's Craig 1, cnw ne 8-11-16w, dr 3298 ft. Thomas Moncrief's Johnson 1, sw ne 9-13-19w, ru. Derby & Empire's Krause 1, se nw sw 17-14-19w, dr 3529 ft. Hartman & Skaer's Knoll 5, ne nw

. . . screen More Oil make . . . . More Money



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2. —Ribs on pipe allow .061 of an inch for oil circulation and permit free flowing of oil into pipe, after straining through the wires.
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17-13-18w, lcn. Davis & Hazlett's Weiland 1, nec 1-15-16w, lcn.

GEARY COUNTY—Pioneer Oil Co.'s Chase 1, se se 19-12-7, dr 3570 ft.

GREENWOOD COUNTY — P. H. Ballieu's Bright 1, ne sw 22-27-12, sd 1210 ft.

HARPER COUNTY—Amerada's Mendiville 1, c se se 24-34-6w, co 5353 ft, td 5360 ft.

JEFFERSON COUNTY—Wichita Oil Co.'s Simpson 1, nw sw sw 19-10-17, ru sd.

LANE COUNTY—Robinson et al's Dickerson 1, sw nw se 11-18-27, csg 2625 ft.

MARION COUNTY—Empire's Jensen 1, se nw 256-22-5e, ur 1640 ft.

MARSHALL COUNTY—Irwin et al's Cooper 1, ne nw 10-3-7e, spd.

MITCHELL COUNTY—Ben Gurley et al's Crombil 1, c ne ne 32-9-7w, dr 3715 ft.

MORRIS COUNTY—Hugh Faulder's Wendt 1, sw se se 18-15-5e, mvg in tools. Skelton et al's Iles 1, nw nw 25-16-5e, rig.

McPHERSON COUNTY—McPherson County Gas Co.'s Stein 1, sw ne sw 17-18-1w, sd 2911 ft; Gustafson 1, cne¼ 9-17-2e, sd 3045 ft. Ted Washabaugh's Vosshell 1, ne ne 9-21-3w, dr 1150 ft.

OTTAWA COUNTY—Anderson et al's Bank 1, ne nw 28-10-2w, dr 2810 ft.

PAWNEE COUNTY—F. C. Troupe's Lovett 1, cel ne ne 31-21-16w, sd 1560 ft.

PHILLIPS COUNTY—Watsonian Oil Co.'s Marklein 1, ne sw 21-3-19w, dr 2745 ft.

RICE COUNTY — Allison & Fitzwilliams' Boland 1, ne sw ne 36-19-8w, cellar.

ROOKS COUNTY—Krueger et al's Poore 1, ne ne 14-8-16w, ur 3160 ft. Prairie's Sandberg 1, c sw¼ 20-9-18w, rig; Gick 1, c se 22-9-19w, rig.

RUSH COUNTY—Danciger O. & R. Co.'s Pinoka 1, c ne 17-19-17w, lcn. Sinclair's Beiching 1, nw ne nw 9-16-16w, dr 2605 ft.

RUSSELL COUNTY — Midwest Ex. Co.'s Austin 1, ne ne 36-12-16, dr 3045 ft by pipe.

SALINE COUNTY—M. Esty et al's Peterson 1, c ne 6-16-5w, spd and sd. Nathan-Jones et al's Robertson 1, nw sw 27-14-2w, ur 2500 ft.

SEDGWICK COUNTY—LaRobb Oil Co.'s Davis 1, ne sw se 36-25-1w, dr 2975 ft. Bu-Vi-Bar Oil Co.'s Steel 1, se cor 1-26-2w, dr 2850 ft. Barnsdall's Samuels 1, ne nw 24-25-1e, fsh 1400 ft; Faber 1, sw nw 6-27-1w, dr 2340 ft. Van Zandt & Mason's Fox 1, c nw sw 19-25-1w, dr 2410 ft. Connell Oil Co.'s Cross 1, ne cor 27-25-1, dr 1200 ft.

SHERMAN COUNTY—A. L. Henson et al's Murray 1, ne se nw 22-7-40w, sd 3035 ft.

STEPHENS COUNTY—W. Sidwell et al's Kelly 1, sw ne 16-34-38w, sd 1160 ft. Trees Oil Co.'s Unknown 1, sw ne sw 3-35-38w, skidrig.

SUMNER COUNTY—Geo. Dickey's Know 1, sw ne 3-35-1w, Wilcox 4244-48 f thfw. Gypsy's Williams 1, nw se sw 16-35-3w, dr 4255 ft. McCulloch et al's Tuttle 1, sw ne 29-34-1w, rust 4160 ft. Otstot et al's Volker 1, nw ne 9-35-1e, Wilcox 4479-4513 ft hfw. Helmerich & Payne's Warlick 1, se ne 8-34-2e, dr 3520 ft. Davidson et al's Strickland 1, sw se 12-35-1w, rig. Roland et al's Pickens 1, ne nw ne 27-30-1w, sd 4132 ft.

TREGO COUNTY—Central Commercial Oil Co.'s Ellis 1, ne sw ne 20-13-21w, dr 2930 ft.

WASHINGTON COUNTY—McCool & Vincent's Linn 1, nw ne 27-4-3e, ru.

EAST TEXAS

Completion

SHELBY COUNTY—
Gulf Ref. Co.'s Pickering Lbr. Co. 1, G. H. Patterson sur, wo 37 3442

BOWIE COUNTY—Hooks O. & G. Co.'s Rosenberg 1, King sur, temp aban 3086 ft.

CAMP COUNTY—Rogers et al's Enfelt 1, Montgomery sur, sd wo 1978 ft.

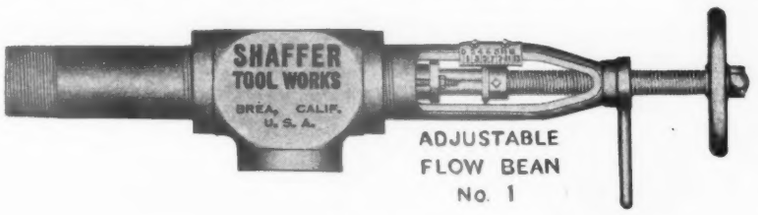
CASS COUNTY—Davis & Pigg's Ed Lambert 1, Lambert sur, sd wo 1952 ft.

RED RIVER COUNTY—Shad Harper's Garland 1, Jos. Wagley sur, sd wt fuel 1590 ft. D. M. Buffington's Hoosier 1, Hughart sur, dr 1105 ft. Johnson Pet. Co.'s Randolph 2, Dean sur, dr 1425 ft.

SHELBY COUNTY—Gulf Ref. Co.'s Pickering Lbr. Co. 1, G. H. Patterson sur, flowing 37 bbls oil after deepening to 3442 ft. Chaparal Oil Co.'s Holt 2, Matthew Moore sur, dr 2207 ft.

UPSHUR COUNTY—F. S. Freeland's Newsom 1, Butler sur, arr ds test 2020 ft; Hudspeth 1, Jackson sur, dk pat.

Shaffer Adjustable Flow Bean



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SMOOTH FLOW — Tapered orifices gives greater flow with less turbulence for any given size opening.

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Perfect handling of Acid and other corrosive liquids. Made of famous "Acimet" Hard Lead Alloy. Body is cast solid—not lined. Connecting flanges furnished for iron or lead pipe.

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Mexican Oil Controversy Settled

Washington, D. C.—Settlement of the oil controversy between the United States and Mexico concerning the application of the Mexican Constitution of 1917 has been brought about by oil regulations promulgated last March by President Calles, according to officials of the State Department in commenting upon press reports of the recent Mexican decree standardizing the general bases upon which future oil concessions will be granted in Mexico's national petroleum reserves.

At the State Department last week it was said that such questions, if any, as may hereafter arise can be settled through the due operation of the Mexican administrative department and the Mexican courts, and attention was called to those provisions of the new Mexican decree whereby it is specifically pointed out that all disputes regarding oil concessions shall be submitted to Mexican tribunals, which shall be the sole courts competent to judge such differences, and there shall not be sought nor accepted any diplomatic intervention in the interpretation of the concessions paragraph.

The executive action of President Calles last spring was declared at the department to be a step voluntarily taken by the Mexican government to end the oil discussions between the United States and that country, and officials emphasized that Ambassador Morrow also feels that such problems can be adequately handled by the administration and courts of Mexico without outside supervision. Since announcement of the new decree no complaint concerning the application of its provisions, under which concessions are granted for 30 years with automatic extensions at the end of that period not to exceed 20 years, has been received at the State Department.

Tulsa.—White Oak Refining Company, which is concluding arrangements to increase its Allen, Oklahoma, refinery to a daily capacity of 8000 barrels, plans to lay a new six-inch line from Allen to the company property in Section 7-9-6, to connect with four 55,000 barrel tanks recently purchased from the J. A. Hull Company.

Tulsa.—Gas Service Company has started the construction work on the distributing system in the city of Neosho, Missouri, where it has been granted a franchise for supplying natural gas for domestic fuel. The system is expected to be ready for service shortly after the first of the year.

Raymond Ford, district manager, Williamsport Wire Rope Company, Houston, spent the past week in Southwest Texas and the Mexican Border country on business.

WANTED—First class production man thoroughly experienced in Ohio, Pennsylvania or West Virginia fields. He must be competent to take entire charge of the field operations of the company which is planning an immediate increase in production from its present proven properties owned in fee. An attractive basis for compensation will be arranged with the man selected. Letters in reply which will be held strictly confidential should give complete data including age, experience and training. Box 60 c-o Oil Weekly.

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Be Careful In The Selection Of Lubricants For Your Motorized Equipment

Passenger cars and trucks of different makes vary considerably in type and design.

Be sure that you understand: (1). The type of lubricating system used, which determines the method of feeding the oil. (2). The type of cooling system used, this factor having more or less effect on the operating temperatures of various parts of the motor.

The proper lubrication of motor equipment means not only the lubrication of the engine cylinders — but the complete lubrication of all of the moving parts of the motor. Much harm can result from the use of too heavy an oil in a pressure system not designed to handle it—also where the "splash" system is used, the oil must not only flow easily, but must atomize readily so as to reach certain bearings which can be lubricated only by a fine mist. Your passenger cars and your trucks are designed to give you many years of service—if they are properly lubricated.

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There is a Humble Oil which is specially prepared to meet every bearing need in your plant, your trucks, or in your automobile.

Humble Motor Oils are the result of years of experience in lubricating internal combustion engines. The recommendations of Humble engineers are an added factor of safety. Whether you operate one passenger car and truck, or a whole fleet of motorized equipment, it will pay you to learn more about Humble Oils.

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A Gate Valve That's Tight—
Easily Operated and Long Wearing

Darling Gate Valves are playing an important part in the production of oil. Their year-in and year-out dependability—their ease of operation—and their never failing ability to stay tight, all these qualities are well appreciated by men in the oil fields who are anxious to produce oil economically and to show the greatest possible returns on the investment in equipment.

Men who use Darling Valves say that their efficiency reduces losses in production to a minimum. They seldom need replacement—they last for years. Back of this superior performance are the years of skillful engineering—of untiring experimenting—and of exacting workmanship with the best materials.

These well known Darling qualities stand out uniformly because Darling tests EVERY valve before it leaves the plant. Others are realizing a big saving by using the right kind of valve—you can do it, too.

Let us send you diagrams showing details of construction. Sent upon request together with catalogue.

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GATE VALVES

NEW EQUIPMENT, CATALOGS, BULLETINS, BOOKS

New CP Compressor for Gasoline Extraction

CHICAGO PNEUMATIC TOOL COMPANY

The Chicago Pneumatic Tool Company, 6 East 44th Street, New York, N. Y., has recently extended its line of gas engine driven compressors to include a vertical compressor especially designed for gasoline extraction and direct driven at 228 r.p.m. by a 200 B.H.P. vertical, three-cylinder, four-cycle gas engine.

The engine is directly connected to the compressor by a flexible coupling of the laminated flexible disc type, a drive that has been used very successfully in the oil fields for several years. The fuel consumption of this unit per million feet of gas delivered is surprisingly low, and the range of gases upon which the engine will operate is very wide, including even the more corrosive gases. Special materials of non-corrosive properties have been employed in both the engine and compressor.

The ease of installation, the wide range of cylinder sizes available, and the overall operating economy of the unit recommend it especially for gasoline extraction work, for well-flowing on a large scale, for experimental work involving widely varying pressures, and for general booster service.

The compressor, which has been designed with special features adapting it to gasoline extraction service, is of the vertical, duplex, double acting design for single or two stage compression to pressures ranging from 30 to 500 pounds per square inch, with cylinder sizes proportioned to absorb the power of the 200 horsepower gas engine.

Remoable Lines

The compressor cylinders are all fitted with removable liners carried in a variety of sizes to suit every pressure between the limits mentioned. The sizes of the cylinders of any compressor can be changed easily on the job by replacing the liner with one of a different size and with the proper size of piston. Liners can be made of special materials suitable for corrosive gases. Liner joints are sealed at the top by a shoulder which comes flush with the cylinder face. The water space at the bottom is sealed off by a rubber gasket which makes a water tight joint.

All valves are located in the heads of the compressor which are of simple construction. The heads of the larger low pressure cylinders are conical to minimize the clearance when accommodating a wide range of cylinder diameters.

The discharge passages all lead to the bottom of the cylinder to permit complete draining off of all condensed vapors. With this design of cylinders no liquids can accumulate behind a piston, and wet gases can be handled without any difficulty whatever.

Inlet and discharge valves are of the Simplate design which have been successfully used for many years in air and gas compressors under the most strenuous conditions. All valves are accessible and valve assemblies can be removed in a very few minutes. While unloading systems are rarely used on such units, nevertheless, the inlet valves can be of the unloading type adapted to complete any system or regulation that may be desirable.

The compressor as a whole is exceptionally compact and yet easily accessible. Large frame doors give convenient access to the interior of the frame and crank-case for inspection and adjustment. Service platform with stairs enables the operator to reach all the upper parts of the compressor.

Diesel Type earings

Main bearings are of the shim adjusted Diesel engine type, lubricated by pressure feed as are also the crank pin boxes. The compressor cylinders are lubricated by a force feed lubricator. Connecting rod bearings are wedge adjusted.

The gas engine is a four-cycle design that in reality is a converted Diesel engine. All main parts of the engine are Diesel engine parts, being identical with those of the Type RH-75 Diesel engine also manufactured by the Chicago Pneumatic Tool Company. Parts are therefore heavily designed for the work to be done.

The most notable features of the engine include removable cylinder liners, full pressure feed lubrication for bearings and two-point, timed, pressure feed lubrication for the cylinders, removable valve cages.

Fuel economy is excellent and regulation is good.

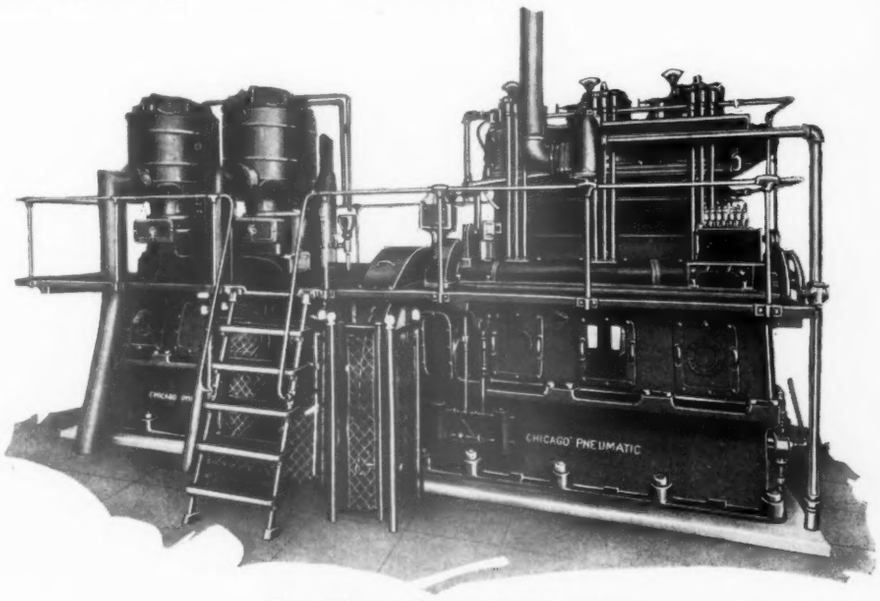
Further information may be obtained from the Chicago Pneumatic Tool Company.

New Catalog on the Precision Drillometer

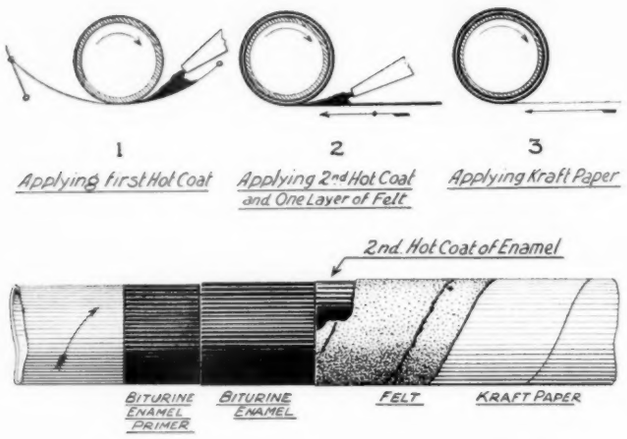
THE DRILLOMETER COMPANY

The Drillometer Company, Los Angeles, has just issued a new and enlarged edition of its Drilling Data Book, which not only describes the Precision Drillometer, manufactured by the company, but also gives considerable information on the latest drilling practice.

Copies of the Drilling Data Book may be obtained from the Drillometer Company.



New Chicago Pneumatic Compressor



Pipe Coating Applied at Mill

San Francisco, Cal.—Considerable interest is being aroused in the oil and gas industry in a new method of coating pipe. This method is a radical departure from the present practice of coating pipe lines, and consists of coating the pipe at or near the mill where it is manufactured.

Hill, Hubbell & Company, manufacturers of Biturine pipe line coatings, are the pioneers in this project, which it is thought will greatly increase the life of underground pipe line by insuring mechanically perfect application of coatings. It is universally agreed that proper application of coatings is the most important factor in the success of any form of pipe line protection. Hill, Hubbell & Company have been vitally interested in this problem, having manufactured one type of pipe line coating (Biturine) for the past 22 years, and have applied it to several thousand miles of pipe lines by contract. Incidentally, during that period the company has pioneered many improvements in methods of coating pipe lines, being the first to design and build a power cleaning machine, a power-driven coating machine, oil burning melting equipment and were the originators of the portable type of lifting derrick now in common use. The many unfavorable conditions incident to the application of pipe coatings, such as inclement weather, unskilled labor, varying temperatures, increased labor costs, etc., all operate to make a first class job of field coating difficult and at times impossible. These conditions have led the company to develop an entirely new scheme for handling the whole situation.

The company conclusively demonstrated that line pipe coated and wrapped at a stationary plant can be shipped any distance required without appreciable damage to the coating. With this idea perfected, the company has established pipe coating and wrapping plants, which are now in operation, at the plant of the A. O. Smith Corporation, Milwaukee, Wisconsin, at the Indiana Harbor plant of the Youngstown Sheet & Tube Company and at the Youngstown plant of the same company. They have contracted to coat and wrap at the above mentioned plants nearly 1000 miles of eight, ten and 12-inch pipe.

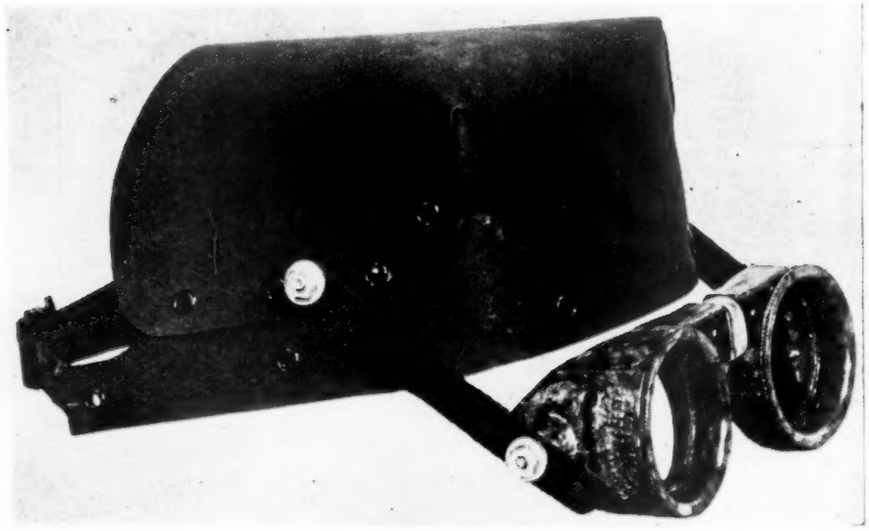
Proper cleaning and wrapping is most important and all of the above pipe will be cleaned of all mill scale by the manufacturers of the pipe, who will also apply to the bituminous primer. On subsequent contracts it may be that the manufacturer's contract will not provide for cleaning and priming. In such cases, Hill, Hubbell & Company is prepared to pass the pipe through a W. K. M. power-driven cleaning machine, which will thoroughly remove the mill scale and simultaneously apply the primer. After the pipe is cleaned it is passed through a patented coating and wrapping machine, all lengths being coupled together with a quick detachable coupling which makes the forward feed continuous. As the pipe advances it also rotates so that the pipe is given a spiral motion. The first coat is applied by means of a canvas sling which is suspended beneath and in contact with the pipe. The hot coating is fed into the canvas so that the rotating advance movement applies a smooth and continuous coating in excess of 1-32-inch thickness. This is illustrated in Figure 1. The felt is wound on under considerable tension providing a mechanically perfect smoothness. Just before this layer of felt reaches the pipe, there is fed all across the surface of it a layer of the hot coating, providing a second hot coating, Figure 2. This insures not only a very considerable thickness of hot coating but also insures a coating absolutely free from pinholes, bubbles, etc. The pipe has now been cleaned, primed and given a double hot coat plus a spirally wrapped coating of felt. The fourth step is the spiral application of 80-pound kraft paper. This is applied dry and is cemented to the felt only by the slight excess of material which is squeezed out between the laps in the felt. The outside of the joint then presents a smooth, absolutely clean and even appearance. There are several reasons for applying the coat of kraft paper. First it presents a smooth, clean surface so that pipe can be loaded on cars without sticking together. Second, the kraft paper being light in color and therefore absorbing less heat, permits the use of lower melting point and therefore a more flexible coating. Third, the light colored paper being applied over the black felt renders any damage to coating instantly apparent.

Goggles

OXWELD ACETYLENE COMPANY

Accessories for welding and cutting recently added to the line of the Oxweld Acetylene Company, 30 E. 42nd Street, New York City, are the Oxweld Cap and Skeleton Type Helmet Goggles.

The No. 9 Cap Type Goggles consist essentially of a strong fibre cap, to which a pair of goggles are attached by means of fibre links. The goggles can be readily raised over the forehead or lowered over the eyes with one hand. The bridge is adjustable and is covered with rubber insulation. Replacable lenses, in the same size and colors as are supplied in Oxweld No. 6 goggles, are used, the colored lenses being protected by cover lenses of clear glass. The No. 10 Skeleton Type Goggles are the same, except that the goggles are attached to a lattice skeleton cap. Both styles are provided with leather straps at the rear for head-size adjustment.



Oxweld Cap Goggles

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for good water conditions—

For long tube life.

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tests better than A. P. I. specifications

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Forged Steel Braden Heads

Here's another BARSCO Product that, because of its more modern superior design and *forged steel* (can't break) construction, renders a *longer service—more economical* because fewer replacements—approximately *lessc than one-half of the weight* of the ordinary cast iron head.

The *forged steel* from which the head is made has a carbon content of from 50 to 60 points and tensile strength of from 90,000 to 110,000 pounds. Will stand up under the most severe service—*no danger of breakage.*

For working pressures up to 4000 pounds

"BARSCO" Forged Steel Braden Heads are provided with an inner thread into which a short piece of casing is screwed. The head is then lowered into position below the derrick floor and set up. Outlets are threaded for 2-inch or 3-inch pipe. These heads are furnished with rubber rings for packing and a split steel ring which can be removed, allowing the couplings to be pulled through head without breaking any connections. Furnished with either solid or split Stuffing Box.

Prices and weights furnished upon application.

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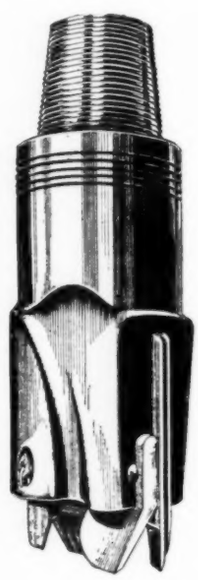
THE LINE OF LEAST RESISTANCE

STRAIGHT-HOLE ROTARY DRILLING BITS always drill 'em straight and round and for less

You well know the hazards of attempting to drill wells through all formations with any bit that washes away side walls or is not supported sufficiently by side reamers to hold it straight when faults, anticlines or sinclines are encountered.

K-P STRAIGHT HOLE Bit has 57 inches of side cutting surface and at average speed of rotary contacts the side wall 240 times per minute. Because of this constant contact K-P STRAIGHT HOLE Bits in action are just like a tube. *They can't slide regardless of the fault and they never cause caving.*



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SQUEAKS FROM THE BULL WHEEL

"Well, George," said a country clergyman to an old man who sat by the wayside breaking stones, "that pile doesn't seem to get any less." "No, wicar," replied the old man, "them stones is like the Ten Commandments; yer can go on breakin' 'em, but yer can't get rid of 'em."

Two negro moonshiners were discussing the merits and strength of their products.

"Ah makes mah licker sa strong," declared one, "dat when yo' drinks it yo' can done smell de cornfield whar dat corn was grown."

"Humph! Nigger, dat ain't nothin'," was the contemptuous comeback, "Ah spilled a few draps of mah licker on mah wife's pansy patch, an' dem pansies dun turned tuh tiger lillies; yas, sah."

"What are your charges, doctor?"

"Ten dollars a visit".

"But we don't want you to come on a visit; we only need you about ten minutes."

"This is certainly a good cigar you've given me, old fellow."

"Shucks! I bet I've gone and given you the wrong one."

Landlord—I've called for the last time. Pay that rent now, or I'll throw your stuff right out on the sidewalk.

Tenant—Sir, you do that, and I'll have every installment house in the city after you.

I met my wife in a funny way—ran over 'er with m' car an' later I married 'er.

If that happened very often there wouldn't be so much reckless driving."

"Pa," said Clarence, "what is a superhuman?"

"He's one, my son," replied his dad, "who still can think of it as a pleasure car while changing a tire in a pouring rain."

Maw and Pa had an awful hard time gettin' married. Maw wouldn't marry Pa when he was drunk and Paw wouldn't marry Maw when he was sober.

A customer stepped into a Los Angeles hardware store. "I want to get one of those thermometers like the Chamber of Commerce uses," he announced. "And what kind is that?" asked the clerk. "It's one that won't go above 80 in the summer or below 50 in winter."

Fiddler: The leading lady seems to have a break in her enunciation this evening.

Orchestra Leader: Say, you keep your eyes on your music.

In a certain southern state a negro was taking a teacher's examination and in answering the question: "Name three prominent Americans in the order of their prominence," replied: "Sears Roebuck, Abraham Lincoln and Booker T. Washington."

The Dean—The undergraduates complain that your language is too pedantic and unintelligible.

Professor Letterking—Impossible. Why, sir, to employ a vulgarism, perspicuity is my penultimate appellation.

"Immediately after he married my daughter the bounder touched me for $500."

"And have you had anything back from him?"

"Yes; my daughter."

"Has my boy," wrote a proud parent, "a natural bent in any one direction?"

"He has," replied the schoolmaster. "He gives every indication of being an industrial magnate some day. He gets the other boys to do all his work for him."

"Yes, Smith is an optimist—he went into a lottery where the first prize was a motor car, and immediately started building a garage."

"That reminds me of Jones—he hadn't a penny left at the end of the month, and so went into a smart restaurant and ordered an oyster supper—he reckoned on paying the bill with the pearls he found in the oysters."

Two Spaniards quarreled, and decided to fight a duel.

In order to do this without attracting too much attention, they took a train into the country.

The first Spaniard booked a return ticket, but his opponent took only a single.

"Caramba!" exclaimed the first. "You expect not to come back, eh, my friend? I always get a return."

"I never do," answered the other, quite calmly. "I always take the return half from my adversary."

"Ye gods! Why did you ditch that queen you had and get a homely nut like that old hen for your stenog.?" exclaimed the friend of the boss.

"To keep from going into bankruptcy," he grinned; "the homely nut does six times as much work as the queen did, and the clerks and I are doing six times more work than we did while she was here."

Why Buckeyes Are Preferred

Buckeye pipe line ditchers are the popular choice of the oil industry—now as for over thirty years past. Convincing proof of this is the fact that more of them are used by the industry than all other makes combined.

So decisive a preference can be created only by superior performance. How Buckeyes have built up this leadership is best told in these exact words of one owner—"they are the *only* ditchers that will meet *all* oil and gas field requirements."

Prominent contractors, who give Buckeye pipe line equipment their 100% endorsement by using it exclusively, are The Oklahoma Contracting Co., Tulsa and Dallas; Williams Bros., Inc., Tulsa; The Hope Engineering Co., at Mt. Vernon, Ohio: Smith Bros., Dallas; Sheehan Pipe Line Construction Co., Tulsa; and Connor & Son Construction Co., Kansas City, Mo. Many other owners cannot be listed because of space limitations.

Buckeye owners are enthusiastic—when they need more machines, they buy additional Buckeyes. You can be guided safely—and profitably—by their experience.

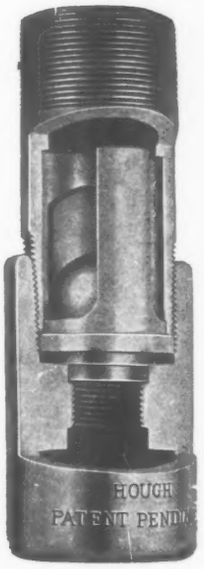
The Buckeye Traction Ditcher Co.

Findlay, Ohio

There's a Buckeye Sales and Service Office Near You.

for over thirty years **Buckeye**

Outstanding Performance



The Hough Extension Lower Valve invariably performs in an outstanding manner because it is designed properly, built right and backed by a reputation a quarter of a century in the making.

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The Chas. N. Hough Manufacturing Co.
Franklin, Penna.

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The OIL WEEKLY

Exclusively Devoted To The Production and Transportation of Oil and Gas

December 14, 1928 **Volume 51. No. 13**

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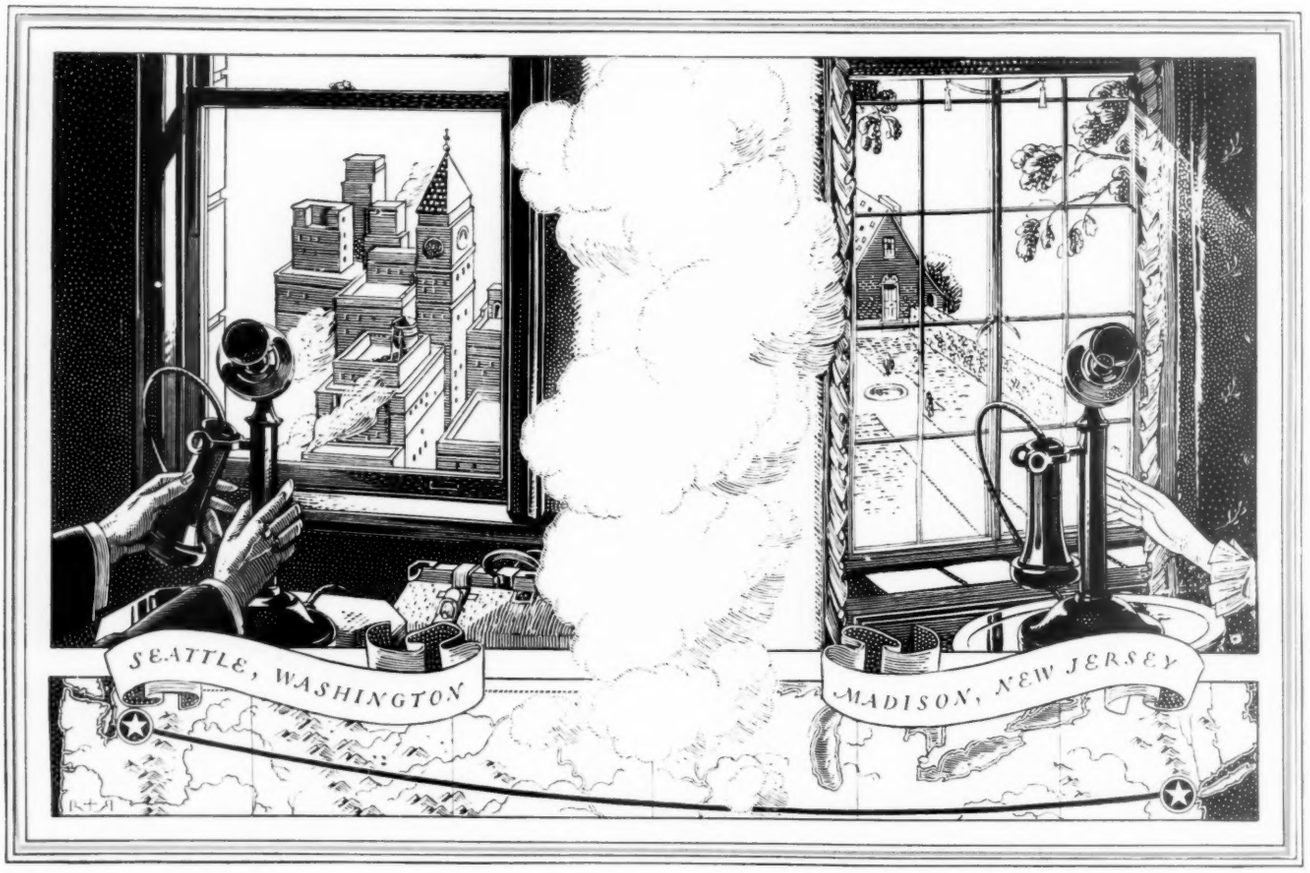
The HUGHES TOOL COMPANY

first in Service to the Petroleum Industry

"Setting Free the Mind as by a Miracle"



An Advertisement for Bell Long Distance Telephone Service

IN SEATTLE, Washington, far from home. Homesick. Lingering doubts and apprehension about the welfare of his family in Madison, N. J., 3000 miles away.

He filed a telephone call, and a few minutes later the operator signaled.

A crisp, "Go ahead, please!" and then across the plains, mountains and valleys came to him the reassuring tones of a familiar voice.

"Setting free the human mind as by a miracle," is how this man describes long distance calls.

And business doubts are banished just as quickly. Whether in business or personal matters, telephone calls will quickly clear the worries off your desk and out of your mind. You will be surprised how little long distance calls cost.

Under the new station to station day rates, Los Angeles to Chicago is only $6.25. Denver to St. Louis, $3.50. Miami to Atlanta, $2.80. Dallas to New Orleans, $2.20. Pittsburgh to Cleveland, 80c. Atlantic City to New York, 70c. Baltimore to Philadelphia, 70c. What distant calls could you make to advantage, now?

The station to station day rate from the Statue of Liberty to the Golden Gate is only $9.00. . . . Calling by number takes less time. . . . . *Number, please?*

AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES — BELL SYSTEM

The OIL WEEKLY. Issued weekly by the Gulf Publishing Co., 3301 Buffalo Drive, Houston, Texas. Subscription price $1.00 per year; 10 cents per copy. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

The Duty to Conserve World Resources

The Oil Producer, both as a forward looking business man and as a member of Society,—does wrong to discard good oil present in emulsions, "cut oil" tank bottoms. The available supply of petroleum is known to be limited. Conservation of National and World resources demands that all oil brought to the surface be *utilized*.

TRET-O-LITE offers the one thorough, scientific, rapid method of reclaiming every drop of petroleum from crude petroleum emulsions. It does this at a negligible cost per barrel of recovered oil. It offers the lowest-cost method known of "producing oil."

Tret-O-lite

Reg. U. S. Pat. Off.

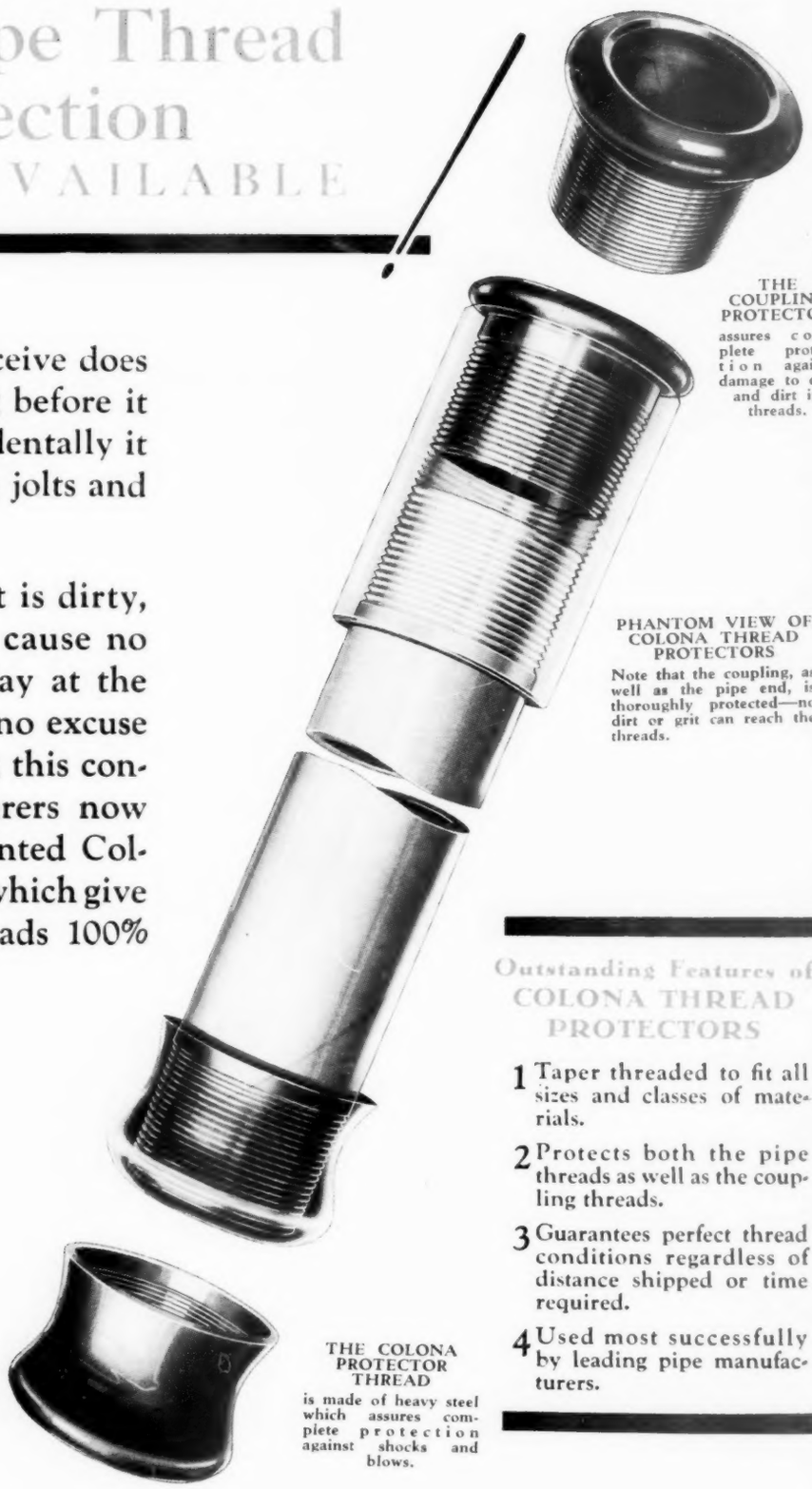
W. S. BARNICKEL & CO.
Webster Groves, Mo.

100% Pipe Thread Protection
IS NOW AVAILABLE

The pipe that you receive does a good deal of traveling before it reaches you—and incidentally it gets a lot of bumps and jolts and rough handling.

The inevitable result is dirty, damaged threads that cause no end of trouble and delay at the well. But today there's no excuse for pipe reaching you in this condition. Pipe manufacturers now have available the patented Colona Thread Protectors which give the pipe ends and threads 100% protection.

So for your own interest, insist on Colona-protected pipe and couplings—it will save you a great deal of re-handling, re-threading and inconvenience.



THE COUPLING PROTECTOR
assures complete protection against damage to end and dirt in threads.

PHANTOM VIEW OF COLONA THREAD PROTECTORS
Note that the coupling, as well as the pipe end, is thoroughly protected—no dirt or grit can reach the threads.

THE COLONA PROTECTOR THREAD
is made of heavy steel which assures complete protection against shocks and blows.

Outstanding Features of COLONA THREAD PROTECTORS

1. Taper threaded to fit all sizes and classes of materials.
2. Protects both the pipe threads as well as the coupling threads.
3. Guarantees perfect thread conditions regardless of distance shipped or time required.
4. Used most successfully by leading pipe manufacturers.

Colona Manufacturing Company
Pittsburgh Penna.